

**Invited Paper submitted to Global Institute of Flexible Systems Management
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**Networking and Knowledge Management for the New Era of Global
Marketing**

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**Key words: Networking, Knowledge Management, Global Competitiveness,
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Abstract

This paper is an attempt to define the Indian opportunity for harnessing the power of the knowledge revolution. Starting from a brief account of the startling pace of discoveries in Gene Technology (GT) and Information Technology (IT) we analyze three critical factors that will determine the rate of success in exploiting such opportunities. The first factor is the role of the State, and that of private enterprise, in shaping the future of education in India. The second is the use of English in instruction and communication. The third factor is the ability to create conditions that encourage and engender entrepreneurial activities. Finally, we suggest some ways to convert the opportunity into a thriving reality, by creating an Indian knowledge network.

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Introduction

The decade that has just passed has witnessed India's transition from a phase of slow progress and under-achievement, to one of opportunities for high, sustained economic growth. Looking back at the fifty years of post-independence developments, we can separate the socio - political and the techno – economic dimensions. On the former dimension, India was a nascent democracy, emerging from centuries of foreign rule and exploitation. The ill-effects of colonial rule were obvious, and included the problems of illiteracy, poverty, and population growth. On the economic and technological fronts, India was denied the benefits of the industrial revolution, since we were not a free nation. In an effort to make up for this loss, the Government erroneously allocated the commanding heights to inefficient public sector industry, while the private sector was mainly occupying a minor and peripheral role.

The Government did make bold attempts in the sphere of education, to simultaneously spread primary and secondary education, and to set up and subsidize Institutes for advanced education and research. However, a significant number of talented graduates from these Institutes were, and are still, seeking outlet for their talents in Western nations. In the area of R&D as well, the Government was the principal investor, establishing agencies such as the Indian Council for Agricultural Research (ICAR), The Indian Council for Medical Research (ICMR), the Council for Scientific and Industrial Research (CSIR), etc. An important element of this policy was import substitution, also in relation to the national missions in space, defense, and nuclear sectors. However, much of the academic R&D tended to be of indifferent quality, with a few exceptions. Meaningful R&D in the public and private industry was virtually non-existent , since the companies functioned in a regulated, license-permit, supply-dominated market-place that was hermetically sealed from external competition.

The key source of technology for the industrial sector was one of the following :

1. Outright (and repetitive) purchase from abroad; or
2. Through collaboration with foreign partners.

Reverse engineering was (and probably is) the most popular means to access new technologies. The absence of strong laws to protect Intellectual Property Rights only encouraged this paradigm of unabashed borrowing and copying. So much for the past; what do we see into the future? As the world's largest democracy, and with a substantial knowledge base, India has unique opportunities to become a key participant in the generation, processing, and commercial exploitation of its knowledge base in the global market-place.

The Knowledge Revolution

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It is perhaps a little difficult to demarcate the exact beginning of the popular “new knowledge revolution”. However, one can say that certain events triggered this process. The first such phenomenon was the scientific development of rigorous research, as opposed to chance discoveries and “blue sky research”. Boundaries of “pure” scientific disciplines started to blur, and overlapping inter-disciplinary and trans-disciplinary areas of research emerged. Two of the “best” examples of this phenomenon are **Gene Technology (GT)** and **Information Technology (IT)**.

Today, virtually all R&D in industry is inter - and trans - disciplinary in nature. This is increasingly the case in many areas of advanced academic research as well. This shift in academia has taken place in response to industries’ demand for new tools to tackle large real – world problems. At the same time, teaching and research in “pure” sciences has begun to be modernized and strengthened. Today, it has become essential to train and teach aspiring scientists to pursue inter – and trans – disciplinary R&D work. Simultaneously, “blue – sky” research has also become better focused to deal with the questions raised by the knowledge revolution, rather than as pure philosophical pursuits alone. Two of the earlier events that promoted trans – disciplinary research work were the Manhattan project, and the Man on the Moon project. The birth of the modern Information Technology (IT) industry can be traced to the Arpanet project, an early 60’s US Defense project. Of course, the most prominent manifestation of this phenomenon has been the birth and mushrooming of the Silicon Valley.

An important event in the “ **Knowledge Revolution**” has been the emergence of “academic entrepreneurs”, which has dramatically changed the conventional views on the role of knowledge in wealth creation. The success stories of the Silicon Valley, and those of Route 128 in Boston among others, have provided respectability to the process of dons and deans turning into entrepreneurs. This has also led to a transformation of the relationship between academia and industry – which was earlier one of a contractor- supplier. Now, newer forms of partnership and collaboration are blossoming.

The competitive dynamics of the “market-place” have started raising demands on the resources of industry and academia to such an extent that no single institution, academic or industrial, is any longer able to undertake all the requisite R&D within its limited physical and organizational boundaries. Thus, the demands of the “customer”, along with the natural growth of inter – and trans – disciplinary R&D, has brought academia and industry closer together in a multi – disciplinary approach to solving large problems. Industry has not only become an important source of funding, but, even more importantly, a source of posing larger scientific challenges.

The Indian Opportunity

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Though India missed out on the Industrial Revolution due to being under colonial rule, we do have an excellent opportunity to play a significant role in the new Knowledge Revolution. On the one hand, there are scores of Indian success stories emanating from the Silicon Valley in California. On the other hand, one can see the transformation of Bangalore, Pune, and Hyderabad into “Knowledge Enterprise Centers” having international brand recognition and recall. Virtually all along the West Coast of India, the cult of knowledge entrepreneurship is spreading, in visible, if not equal, proportions. There is no reason why this phenomenon should not spread to the other parts of the country, especially the North and the East.

The basic characteristics of the key players in this emerging entrepreneurship are that they are young, and well – trained in science and engineering (graduates / post-graduates). In addition, many of them possess graduate degrees in management as well. The steady, if slow, modernization of the Indian telecommunications facilities has resulted in easier individual access to e-mail and Internet facilities for this class of entrepreneurs. This, combined with the ease of air travel, has enabled these technocrats to operate from multiple locations around the world. Many of these emerging engineer-turned-managers seek exciting opportunities with established IT companies, often catering to, and even being located in, the USA. The majority of this class of entrepreneurs tend to seek their fortunes in the USA, primarily because of the enormous support and encouragement provided by venture capital firms, and other user-friendly investors (also known as Angel funds), who are prepared to take higher risks, as well as reward even those entrepreneurs who may have unfortunately failed earlier. The venture capital industry is yet in its infancy in India.

A large number of **knowledge workers** are now being employed by a growing number of International companies, who are relocating their “back office” e-commerce activities, ranging from manufacturing to banking and other services. India is now the preferred location of several international **knowledge-related** commercial activities. The Political and Economic Risk Consultancy Ltd. Ranks India at the top in terms of quality, cost, and availability of skilled knowledge workers (Anonymous, 1999). This survey puts India ahead of Philippines, China, Australia, Japan, Taiwan, Vietnam, South Korea, and several other countries. Given India’s unique advantages, this process of employment generation in the **knowledge management** sector is likely to exceed and surpass that provided by the manufacturing sector until now.

Strategic Exploitation of the Indian Opportunity

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Three factors will determine the success (or otherwise) of India's strategies to exploit the opportunities in the **knowledge sector**. These are as follows:

1. The role of the state, and that of private industry, in the development of education in India. Given the diminishing funds available with the Government, it is politically imperative for these scarce resources to be primarily utilized for attaining mass literacy rates, and for universalizing primary education. Simultaneously, the State must encourage, enable, and empower the private enterprise to enter the spheres of secondary and higher education, especially for the professional programs in Engineering, Medicine, Management, and Law. The private sector also has very attractive opportunities to spread primary and secondary education, via innovative uses of distance education and web-centered learning tools. In the sphere of university and higher education, where the private sector is the main beneficiary, it has an obviously much larger role in funding such institutions. One such role could be in terms of research partnerships with academia. Many such partnerships, with varying degrees of university and industry participation, are already being witnessed, especially in hi-tech areas such as informatics, biotechnology, communications, new materials, etc. The second, and perhaps more gratifying, phenomenon is the grants and endowments being made by "successful" NRI 's from USA, to modernize and advance the quality of the R&D infrastructure in their Alma Mater.
2. The second important determinant of India's success in the **knowledge management** sector will be the spread of the learning of English, and its use as a medium of instruction. Occasionally, politicians have gone on "English bashing", and have raised the bogey against the use of English, mostly for narrow political and chauvinistic needs. In spite of this, English has managed to survive as a language of business in large sections of Indian commerce and industry. English is the language of the **knowledge era**, and its importance as a key to the growth of knowledge industry must be acknowledged by one and all.
3. The third factor that will determine India's success in the **knowledge industry** is the need to create conditions which will engender a culture of venture capital and Angel funding. These are two important instruments which fuelled the knowledge revolution in the USA, and have also now spread to Europe. The demands of the knowledge sector are quite different, qualitatively and quantitatively, from the social and risk market profiles catered to by the traditional banking sector. The gradual emergence of such risk capital instruments and institutions in India is already beginning to fuel the growth of high-risk **knowledge entrepreneurship**. However, the chances of a venture capital culture blossoming in a traditional government environment have yet to be understood.

Creating an Indian Knowledge Network

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Having looked at the knowledge revolution, and the emerging paradigms of the Indian scenario therein, let us enumerate some ways and means to convert the Indian opportunity into a reality. Our basic assumption is as follows : With the success of Indian scientists and engineers in the USA in the IT, pharmaceuticals, finance, and consultancy services, there is an “inherent incentive” for carving similar success stories in India as well. The process of discovering the Indian *knowledge iceberg* has tentatively begun in the last 5 years. Major MNCs such as IBM, Philips, and GE have endowed and created research partnerships in the Indian Institute of Science, as well as in one of the Indian Institutes of Technology (Anonymous, 2000). A number of Indian companies have also begun to establish long – term R&D contracts with individual researchers and groups in academia. Such partnerships are often based on joint endeavors to explore large technology problems. They are usually long – term by definition, and are sustained by covenants which cover the interests of the parties involved. They are thus different from the traditional contract research arrangements between industry and academia (Iyer, 1997). Some of these multi-national companies, which started their Indian experiment by forging such academic partnerships, have, subsequently, begun to establish full – fledged R&D Centers in India, with the primary objective of harnessing the Indian *knowledge capital*.

While the above approach seems to be working fairly satisfactorily, there seems to be a more purposeful way of going about leveraging the Indian *knowledge advantage*. To start with, one could collate a *database* of the major university departments and scientific/ technological institutes. Such a database could, to start with, have information on the faculty expertise in designated areas of specialization(s), their contribution(s) in research, consultancy, and other industry project(s), publications profile, awards and honors won, patents filed, and membership(s) of professional society(ies). This may, subsequently, be supplemented with additional data on the quality and quantity of the post – graduate research and training output. The value of building up and annually updating such a industry – specific database can be gauged from the fact that industry would be more than happy to pay for such scarce information.

Conclusions

In this new era of the *knowledge revolution*, India must seek out and exploit some of its inherent strengths to accelerate economic development, while creating extremely attractive avenues for employment generation. Bio –technology (BT) and Information Technology (IT) are the two new pillars of the era of *knowledge*

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management. Indian science and engineering graduates have made an international mark in both these corner-stone disciplines. IT is now emerging as an engine of economic growth in India. The Indian knowledge pool has been built up, and is sustained, in the prominent science, engineering, and management institutes of this country. However, this resource has so far been grossly under-exploited for the creation of wealth and high-value employment generation. The dominance of trans- and inter-disciplinary research domains to solve large and complex technology problems will require *networking for the knowledge revolution*. This paper has presented one such model of an industry-specific database, comprising the expertise, facilities, and capabilities of technology generation that could be commercially profitable for academia and industry alike.

References

1. Anonymous, 1999. Far Eastern Economic Review, Sept. 2 1999.
2. Anonymous, 2000. The Economic Times, Aug. 24 2000.
3. Iyer, Parameshwar P. 1997 . Technological and Management Issues in Synergizing University – Industry R & D . in “ Globalization , Flexibility , and Competitiveness” ; Proceedings of ICMOT '97 : International Conference on Management of Technology . IIT Delhi , December 1997 . pp. 1095 – 1109.