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OFFSHORING OF IT AND IT-ENABLED SERVICES:

how far does India benefit from Its outsourcing industry

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ABSTRACT

The literature on services offshoring typically focuses on the extent of job losses in the home country. The impact on recipient countries is rarely examined in the western debate on offshore outsourcing. The purpose of this paper is to analyze the impact of offshoring in information technology (IT) and IT-enabled services (ITES), including business process outsourcing (BPO), on employment creation and technology diffusion/innovation gap in India. The paper concludes that being a service industry, the IT/ITES sector cannot be expected to solve India's massive unemployment problem. India needs to build labor-intensive, manufactured products, not just services, in order to create jobs for millions of educated but unemployed young Indians. Concerning technology diffusion/innovation gap, in spite of impressive progress achieved by Indian service providers, they continue to lag behind in high-end areas that call for creativity and innovation such as inventing innovative business products, and creating new global markets for such products.

Keywords: Offshoring. Information Technology. Innovation. India.

1 INTRODUCTION

A by-product of the "flattening of the earth" has been the freedom of global businesses to engage in "offshore outsourcing" – the business practice of relocating labor-intensive manufacturing or service functions from an internal to an external source anywhere in the world. From the business viewpoint, offshore outsourcing can provide dramatic cost savings, permit the fragmentation of the value chain, enable a company to concentrate on its core competence, and leverage resources to higher-value-added products and services in order to create sustainable competitive advantage (Brown and Wilson, 2005; Prahald and Krishnan, 2004.) Although offshore outsourcing has been going on for a long time in countries like Ireland, Israel and Turkey, recently it has attracted a great deal of political attention recently due to the alleged "loss of domestic jobs" in the United States, Europe and elsewhere to China in the manufacturing sector and to India in the services sector.

A review of the literature reveals that a great deal has been written in the west on the economic and technological issues involved in offshore outsourcing of services, but such writings have focused exclusively on the pros and of "global labor arbitrage", the extent of job losses in the home (exporting) country, and the plight of the workers whose jobs have been 'Bangalored." The development impact of offshore outsourcing of services in the host (recipient) countries is rarely examined in the ongoing western debate on outsourcing.

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The purpose of this paper is to examine some of the economic and technological issues pertaining to offshore outsourcing in the IT/ITES-BPO service industry in India. Specifically, the paper examines the impact of offshore outsourcing on (a) employment creation in India, and (b) technology diffusion/innovation gap in India.

2 AN OVERVIEW OF THE IT/ITES-BPO INDUSTRY IN INDIA

India's $30 billion plus export industry of IT/ITES-BPO has been growing at an impressive annual average rate of around 35 percent since FY 2002-03. The Tier I Indian companies (Tata Consultancy Services, Infosys, Wipro, and HCL Technologies) regularly report double-digit growth in client base, sales revenue, and net profit. They rank among the top 14 largest IT companies in the world in terms of manpower, profitability, and stock market capitalization. These top four Indian companies register annual revenues of more than $1 billion each, and together with Satyam, are also India's leading IT exporters. [1] (NASSCOM, Strategic Review 2005, and 2006.)

India ranks as the number one destination for offshore outsourcing of IT and ITES-BPO, accounting for nearly one-half of the highly competitive global outsourcing market. India is the second largest exporter of software in the world, and some 300 of Fortune 500 companies do business with Indian IT services companies. Twenty out of fifty best-managed outsourcing vendors in the world are based in India -- either captive companies of multinationals or local Indian companies. [2] In addition, India's top BPO firms generate huge revenues from foreign sources and employ a large number of people. [3] Thus, India has been able to build up valuable brand equity in this industry in global markets.

By 2010, the outsourcing industry is expected to account for seven percent of Indian GDP, attract one-third of all foreign investment in India, generate around $60 billion in annual export revenues (35 percent of exports), and create more than one million additional jobs. In addition, this sector has fuelled the growth of a number of ancillary businesses such as transportation, real estate, hotels, catering, and so on, and has created 3 million additional jobs via indirect and induced employment. With some 1.6 million of India's vast and talented educated people currently working directly and indirectly in this sector, the outsourcing

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industry exercises a major influence on the Indian economy (Department of Information Technology, Government of India, 2005-06; NAASCOM, Strategic Review 2006.)

India is the principal outsourcing destination because it combines the twin advantages of low-cost and high-quality labor. In addition, by this time the top Indian vendors have mastered multi-country service delivery capabilities, thus enhancing their usefulness. As the cliché goes, multinationals go to India for low cost (NASSCOM estimates that offshoring to India generated cost savings between 25 and 60 percent for the IT sector, and 78 percent for the ITES-BPO sector over the U.S. cost base) but stay for the high quality in software and business process services. India has the highest number of qualified engineers and the largest pool of offshore talent in the world (Paul, 2004; The McKinsey Quarterly, Special Edition 2005.)

In the offshore outsourcing industry, India is the only country in the world that has the largest number (more than 400) companies possessing international quality certifications. Some 82 of these companies are assessed at Carnegie Mellon's Software Engineering Institute (SEI) Capability Maturity Model (CMM) Level 5 – the highest international standard for quality attainable in software development. India has more companies assessed at this quality level than any other country in the world. India also has numerous companies assessed at the International Standard Organization (ISO) 9000/9001-level certification standards for high-quality manufacturing. Many Indian companies have also implemented Six Sigma methodology – a corporate-wide approach for ensuring high-quality performance. In this sense, India has truly become a "quality knowledge hub – the world's leading supplier of human intelligence" (Department of Information Technology, Annual Report 2005-06, p. 2.)

2.1 LOCAL EMPLOYMENT

There is no denying that with offshore outsourcing the host country gains in terms of employment generation, but the absolute numbers in India are only superficially impressive and cannot possibly be expected to make a dent in India's overall unemployment picture.

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2.2 STATIC EMPLOYMENT EFFECTS

Table 1 shows the growth of Indian software exports from fiscal year (FY) 2002-03 to 2006-07. As can be seen, total Indian software exports have been enjoying an annual growth rate of 35 percent, the IT component of which has been growing at 34 percent, and the ITES-BPO component at 35 percent in U.S. dollar terms.

TABLE 1: INDIAN SOFTWARE EXPORTS, FY 2002-2003 - FY 2006-2007 (US $ BILLIONS)

Fiscal Year	IT Services & Software	ITES-BPO	Total Exports
2002-2003	7.1	2.5	9.6
2003-2004	9.2	3.6	12.8
2004-2005	12.2	5.1	17.3
2005-2006	17.1	6.3	23.4
2006-2007*	23.0	8.3	31.3* Estimated

Sources: Ministry of Finance, Government of India, Economic Survey, 2004-2005, pp. 147-148; NASSCOM Strategic Review 2005, and 2006, p. 28.

Table 2 shows the growth of employment in IT/ITES-BPO sector (the latter defined as customer care, finance, human resources, payment services, administration, and content development) in India from FY 2002-2003 to FY 2006-2007. As can be seen, total employment in this time-period grew at an annual average rate of 45 percent, employing some 1.6 million people in FY 2006-07.

Table 2 - Employment in it and ites-bpo sectors in india, fy 2002-03- fy 2006-07 (thousands)

Fiscal Year	**IT software exports**	**ITES-BPO**	**Total**
2002-2003	205,000	180,000	385,000
2003-2004	270,000	253,000	523,000
2004-2005*	345,000	348,000	693,000
2005-06	878,000	409,000	1,287,000
2006-07*	1,085,000	545,000	1,630,000* Estimated

Sources: Ministry of Finance, Government of India, Economic Survey, 2004-2005, p. 148; NASSCOM Strategic Review 2005, and 2006, pp. 34, 156; NASSCOM, "Industry Trends", May 11, 2006.

Yet, in spite of these impressive statistics, the IT industry as a whole accounted for less than 5 percent of Indian GDP in FY 2005-06 and employed one million plus people in a

land of more than a billion people. Of course, the outsourcing industry in India is expected to grow in the future to 7 percent of India's GDP and employ yet another 1 million people by 2008. Still, even these optimistic job numbers will still amount to barely over 1 percent of the massive Indian labor force estimated to be some 600 million people in this decade (Department of Information Technology, Government of India, 2005-06, 2003-04; Joshi, 2004.)

2.3 DYNAMIC EMPLOYMENT EFFECTS

It is true that such static calculations do not take into account the dynamic spillover and multiplier effects of the IT/ITES-BPO industry on other tertiary industries such as transportation, construction, real estate, security, catering and hospitality, and so son. NASSCOM estimates that the outsourcing industry has created 1.3 million indirect and induced jobs in ancillary services. Undoubtedly, the outsourcing industry has generated a booming middle class of young professionals with high disposable income that is contributing to India's national income, tax revenue, and an increase in consumer spending, particularly in real estate, construction, shopping malls, hotels, airlines, and mobile phones. The industry has also brought to the international forefront India's attractiveness as an investment destination, and this "prestige" factor is hard to quantify. Lastly, it has contributed to a reversal of the "brain drain" as expatriates of Indian origin return to India for good.

In particular, the BPO sector, including its knowledge-process outsourcing (KPO) sub-sector, has enormous job-creating potential in the future in such activities as corporate planning, market research, investment valuation research, patent filing, legal and insurance claims processing, biotechnology, pharmaceuticals, healthcare, business and commercial information, distance learning, and many more. By 2007, the BPO sector in India is estimated to bring in $16 billion in revenues, capture some 49 percent of the overall offshore BPO market, and the KPO component of this sector is expected to create 300,000 jobs by 2010 (NASSCOM, Strategic Review: 2005; Confederation of Indian Industry, 2005.)

2.4 DICHOTOMOUS DEVELOPMENT

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Taking into account both the static and dynamic factors, the outsourcing industry will probably employ some 5 percent of the Indian labor force by 2008. However, this is a highly optimistic scenario. Ironically, as the top Indian vendors move up the "food chain" from BPO/KPO, design, programming, testing, maintenance and documentation tasks to higher value-added services such as product development, customization, system integration, IT consulting, and business consulting, such higher-end services require less and less labor. Also, some of the remote work that used to be performed out of India by Indian service providers is now being done out of other low-cost, talent-rich locations like China, Vietnam, and Eastern Europe. In addition, only about 25 percent of some 400,000 engineers graduating annually in India are suitable for offshoring jobs at multinational corporations, and the top Indian companies recruit only about 1 percent of job seekers.

India has more than 40 million people looking for work, and an additional 35 million will join the labor force by 2008. The vast majority of educated young people in India, numbering some 200 million, are outside the elite loop of outsourcing since they are not employable in the industry due to lower-quality educational institutions they graduate from. In fact, the educated youth would probably comprise more than half of India's unemployed within the next decade and could constitute a "ticking bomb" for India if the economy does not create enough jobs for them (Basu, 2004; The McKinsey Quarterly, (3), 2005.)

Creating jobs for all these millions of unemployed Indians will require more than nurturing the outsourcing service industry alone. Only labor-intensive manufacturing can provide jobs on such a scale. India may have "missed the boat" with respect to Chinese- style low-cost, labor-intensive manufacturing, but India may have some advantages over China in "discreet" manufacturing or manufacturing activities that requires engineering skills (Joshi, 2004; India Abroad, February 16, 2007.) Without this job-creating possibility, however, as the "enclave" thesis maintains, the outsourcing industry in India will probably end up by creating "pockets of affluence" in sumptuous suburban campuses, leading to a highly dichotomous development process (Asian Development Bank, 2004.)

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2.5 TECHNOLOGY DIFFUSION/INNOVATION GAP

In spite of impressive progress made by top Indian software companies in moving up the value chain to higher-level, sophisticated services, the fact remains that so far they still operate as “low-cost/high value” service providers. They have not yet reached the stage where they are able to manufacture, commercialize, market, and export a technological final product. Hitherto, the elite Indian companies have shown few signs of causing “new market disruptions” and are quite content to be “low-end disrupters” rather than innovators. Thus, even though India has gained by way of technology diffusion from western multinational companies, the innovation gap continues to persist.

Certainly, the more advanced Indian companies today have gone far beyond the traditional “hub-and spoke” model in which strategic functions (such as innovation, business consulting, IT consulting, defining requirements, etc.) are generally retained in the home country, while non-strategic, labor-intensive activities (such as design, programming, testing, documentation, maintenance, etc.) are typically outsourced (Simpson, 2004.) These sophisticated Indian companies have moved up the value chain by going beyond the traditional project-oriented, technology-specific outsourcing contracts to an integrated “global onshore-offshore delivery model.” This model involves “cross-selling and up-selling” a broader range of complex and higher value-added, domain-focused, services and solutions (such as business portfolio analysis, change management, sales and marketing relationship management, supply chain management, defining the client’s market in relation to competition, packaged applications implementation, custom application, IT consulting, R&D, product design and development, remote network management, and systems integration.)

The Indian service providers are acutely aware of the fact that in this era of globalization of the services industry (particularly financial services), an outsourcing partner must provide services on the business and process side (such as time to market, customer relationship management, operations management, and the like), not just on the technology side. Therefore, top Indian companies are delivering domain knowledge in key verticals (industry-specific) such as financial services, health care, manufacturing, retail, life sciences, telecom, media, and so on. They have developed cost-effective processes for managing large-

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scale projects in distributed locations combining customer-side activities with development activities (Murthy.)

The BPO industry too is moving up the value ladder from providing horizontal low value/high volume communication and data-driven activities to delivering vertical high value/low volume analytics-based, knowledge-processing services (such as clinical data management, biometrics, market research, financial research, securities processing and lending, risk management, real estate management, fund management, actuarial modeling, insurance claims processing and underwriting, medical, accounting, legal work, and so on.)

Thus, the top Indian companies have been able to put together multicultural teams consisting of IT specialists, management specialists, domain experts, and behavioral experts from multiple countries in order to deliver customer-focused consulting and technology package deals to multinational clients (NASSCOM, Strategic Review, 2005.)

Today, India has emerged as a major global design center for higher-end technological tasks that were not outsourced before. In particular, Bangalore has been able to attract several creative/planning jobs, including high-tech product development, product design, software architecture, content development and design, and R&D. Multinational companies like IBM, General Electric, Motorola, Intel, and Microsoft have opened cutting-edge R& D and technology design centers in Bangalore and elsewhere. Famous Indian companies can deliver some very advanced engineering design and development work in large-scale projects (including aerospace) in distributed locations anywhere in the world (NAASCOM, Annual Report 2004-05; NASSCOM, Strategic Review 2005.)

2.6 ROLE OF THE INDIAN GOVERNMENT

The Indian government's support of the software industry, coupled with economic liberalization measures, has certainly been conducive to the success of the Indian outsourcing industry. [4] The overall result of the government-supported free environment for the high-tech sector was to create a highly competitive environment for the Indian firms, which were forced to adopt world-class infrastructure, quality control processes, and human resource management practices. Now the Indian government needs to introduce "second-generation" reforms in the field of education by privatizing higher education institutions, enlarging the

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number of engineering Ph. D candidates, introducing meritocracy in the academic labor market, and increasing faculty salaries to industry level. The issue of the quality of training of workers in the outsourcing industry, particularly in managerial and marketing skills, is going to be problematic for India in view of poor faculty salaries and deteriorating physical infrastructure, even in elite universities and technical institutes (Murthy, 2004; Singh, 2004.)

3 LOOMING PROBLEMS ON THE HORIZON

The conventional wisdom concerning India's strong fundamentals in offshore outsourcing stresses the level of government support, quality of the labor force, proficiency in English, entrepreneurial culture, project management skills, and exposure to new technologies (Department of Information Technology, Government of India, 2003-04.) Such a rosy picture explains only part of the story. The so-called Indian advantages mentioned above might dissipate over time due to a variety of reasons over which the Indian companies may not have much control.

First, offshore outsourcing is a part of the strategic planning process of a multinational company in which a host of variables (including relative labor costs, logistics costs, customer requirements, time to market, skill levels and business experience, size of the local market, infrastructure facilities, and political and currency risks) enter into management calculations concerning the choice of an outsourcing location. The "portfolio approach" to offshoring maintains that spreading outsourcing relationships across a basket of low-cost regions and countries reduces risk and increases potential reward for a multinational company. Recent trends in outsourcing show a shift away from the client's reliance on a single vendor to provide end-to-end services (or the entire spectrum of outsourcing services including IT consulting, application outsourcing, BPO, and infrastructure outsourcing) to "unbundling" requirements, and opting for "hybrid structures" or "extended organizational forms." The latter involve partnering with a network of multiple "best-of-breed" service providers in specific areas of their strengths such as application development or industry-specific expertise. These relationship-seeking, rather than transaction-focused, customers expect vendors to simultaneously bring to bear technical knowledge, industry knowledge,

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knowledge of competitors and market trends (Vestring, Rouse & Reinert, 2005; NASSCOM, Strategic Review: 2005.)

Secondly, India's current cost/quality advantage faces serious competition from rival locations such as China, Vietnam, the Philippines, South Africa, Russia, the Czech Republic, Hungary, Poland, and Canada. This competition will be particularly problematic if wage pressures continue to build up in India, attrition rates (currently ranging from 35 to 45 percent in call centers) in the ITES sector continue to skyrocket, and faculty shortages at the post-graduate level continue to mount. If multinationals are flocking to India now to set up captive units (they have 40 percent share of the BPO market in India), they are doing so to fill a particular gap (e.g., labor-cost gap, talent supply gap, etc.) at a particular point in time. History has taught us that one can never be sure whether multinationals will remain in one particular location such as India (or any other place for that matter) over the long haul.

Already, there are signs that India's labor advantage is dwindling due to rising wages, high turnover rates, and a shortage of skilled manpower. It is estimated that demand for qualified IT professionals will outstrip supply in India soon, resulting in further wage pressures and higher attrition rates (ranging from 15 to 30 percent) in the near term. India's cost advantage may be cut in half by 2007, and the current wage differential of 35 percent for higher-end services might shrink to 9-to-18 percent. It remains to be seen whether the elite Indian educational institutions (seven Indian Institutes of Technology and six Indian Institutes of Management) will be able to produce sufficient trained professionals to meet increased demand, and even if they do, quality of training might suffer due to heightened pressure to meet this demand (NASSCOM, 2006; McKinsey, 2005 Special Edition.) Interestingly, due to acute competition for this limited pool of talent, high-prestige Indian companies like Infosys that used to recruit only from the top engineering and management colleges in India are now hiring graduates from lesser-known educational institutions and offering them lower salaries.

Concerns over heightened competition, rising labor costs, high attrition rates, and future growth prospects are reflected in the generally declining prices of stocks (American Depository Receipts) traded on Wall Street of the top Indian vendors – Wipro, Infosys, Satyam, TCS, and HCL. Further, until recently, India attracted only 5 percent of the total venture capital/private equity invested in Asia, as compared to 40 percent for China including

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Hong Kong. And over 90 percent of these so-called "risky" investments in India were in fact made only in existing, profitable, top Indian companies. Only now private equity capital is pouring into India in a big way.

Yet, Wall Street analysts are puzzled by the ability of these Indian companies to generate double-digit (in the range of 30-40 percent) revenue growth, deliver high profit margins (earnings before interest, tax, depreciation and amortization/revenue) of about 30 percent, maintain high price-earnings ratios at more than 20 on average for the top companies, and ensure stability in client billing rates despite rising wage pressures in the Indian labor market (Pradhan, 2003; NASSCOM, Strategic Review: 2005.)

While the concerns of Wall Street analysts about long-term growth prospects for these companies may be legitimate, it appears that in the near term (over the next 2 to 3 years) there is enough room for these world-class Indian companies to grow in attracting clients from Fortune 500 and Fortune 1,000 companies. While salaries and bonuses of IT professionals have been increasing at a rate of about 10 to15 percent annually, billing rates vis-à-vis large clients have been remarkably stable, going up by one-half the rate of growth in salary cost. Indian vendors have managed to withstand higher cost pressures due to declining telecom and infrastructure costs, moving to higher-yield services such as consulting, package implementation, running thinner but more efficient operations, and achieving improvements in scale economies and productivity.

2.1 COMPETITION FROM CHINA

In the long run, however, of all the possible competitors to India in offshore outsourcing, it is China that poses the gravest threat. China is investing heavily in producing English-speaking engineering graduates and software professionals, and these investments are expected to bear fruit in about a decade's time. However, as of now, China's IT services industry remains highly fragmented, consisting of multiple players (some15, 000 service providers), the majority of which are small players based in one particular city or province with less than 15 employees doing basic programming and niche applications. Chinese IT firms do not yet possess the size and expertise needed to attract large international clients. [5]

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The current Chinese situation is subject to dramatic change with time. With greater consolidation under government pressure, improved talent base, tax incentives, "single window" processing, and lower power costs, the fragmented IT industry in China will in all likelihood regroup fast, posing a serious threat in the future to India's dominant position in the outsourcing industry. China outbids India by at least a 5:1 factor in attracting foreign direct investment, accompanied by a great deal of technology transfer and R&D placement, some of which will most likely spill over into the IT sector. Already, clusters of excellence are emerging in northeastern China, attracting multinational companies like IBM, General Electric, and Accenture.

The major Chinese weaknesses – lack of intellectual property rights protection, and low level of innovation – are also India's weaknesses. In addition, India has certain highly visible weaknesses, such as deteriorating physical infrastructure, perpetual power blackouts, and the like that China does not have, at least to that extent. The so-called Indian advantage over China in the English language may not be material in the outsourcing industry, except in call centers and transaction processing. In any case, since 1992, English has replaced Russian as the main foreign language taught in Chinese schools, and it will probably take a decade or so before the Chinese become functionally proficient in English (The McKinsey Quarterly, (1), 2005.)

Of course, the India-versus-China competitive scenario does not necessarily have to be phrased in "either-or" term. In typical eclectic Asian fashion, it can be phrased in "this-and-that" term. The size of the outsourcing pie may be large enough to accommodate both of them with different specializations for each player, i.e., offshoring work for India, and captive work for China. This is precisely what the Chinese Prime Minister had in mind when, in his last visit to India in April 2005, he invoked the "two pagodas" alliance in which China would concentrate on hardware and India on software. The technological collaborative agreements between China and India, signed in New Delhi in April 2005, open up new vistas for the outsourcing business, dominated by the Chinese in the manufacturing sector and by the Indians in the services sector.

The top-tier Indian companies have already set up software development centers in China to take advantage of lower-cost skills, and the Chinese manufacturers are in the process of entering the vast market of India. The entry into each other's huge markets will hopefully

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enable both countries to become global players in a bigger way. The Indian vendors, with their diversified service portfolio, deep industry-specific expertise, and far-flung, worldwide operations, are well poised to meet the multinational clients' needs. [6] They are also operating in other low-cost, talent-rich areas such as Vietnam, Brazil, and Eastern Europe. Thus, the leading Indian vendors have proven capability to deliver multicultural teams in distributed geographies to serve global clients efficiently in both onshore and offshore locations.

2.2 ROLE OF THE HARDWARE SECTOR

In reality, though, probably one reason why India will continue to be the preferred destination for offshore outsourcing in high-tech services is the correlation between low wages and low capacity for technological competitiveness and innovation. Studies have shown that India ranks the lowest among top countries in the world in technological capacity and competitiveness, i.e., the ability to manufacture, commercialize, market, and export a technological final product (Simpson, 2004.)

Table 3 shows that in IT/ITES-BPO exports out of India, services account for more than 96 percent of revenue generated, and the share of hardware (e.g. electronic product development) is negligible amounting to less than 4 percent. The reasons behind this poor showing of the hardware sector include lack of domestic availability of inputs, government controls on imports and capital goods, inflexible labor laws that discourage entrepreneurship, poor infrastructure, and high interest rates – all contributing to a high-cost structure for hardware exports (Paul, 2004; NAASCOM, Strategic Review 2005.)

Table 3 - Composition of indian it-ites exports, fy 2003-04, 2004-05 (percent)

	FY 2003-04	FY 2004-05
IT Services & Software	69.1	67.8
ITES-BPO	27.0	28.4
Hardware	3.8	3.7

Source: NAASCOM Strategic Review 2005, p. 27.

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Table 4 shows that in the Asia-Pacific region India ranks only number 6 in total R&D spending on information and communication technology.

Table 4 - Total information and communication technology spending ($ millions), 2004

Country	Spending
Japan	425,095
China	110,468
South Korea	61,921
Australia	37,223
Taiwan	33,966
India	28,247

Source: NAASCOM Newsline: 2004 (32).

The manufacturing of electronic hardware (such as semiconductors and other components) is characterized by high fixed costs and calls for large-scale investments in R&D and infrastructure that are not in the cards in India. Neither does India possess global product marketing skills on a big scale. Unlike East Asia, India's development policies have not supported the emergence of an export-led, world-class manufacturing industry. The "triple disconnect" in the Indian outsourcing industry between hardware and software, foreign and domestic markets, and services and products is a matter for concern (D'Costa, 2004.)

3.3 SHORTCOMINGS OF THE INDIAN SERVICE PROVIDERS

Generally, only the leading Indian software service companies are able to offer a wide-ranging bouquet of global services ranging from IT infrastructure, and software testing to BPO, IT architecture, and IT consulting. But even they do not have the global reach of western multinationals like IBM, Accenture, and EDS

Only a few elite Indian companies such as Wipro and Satyam have engaged in "big leaps" such as "string-of-pearls acquisitions" of major western companies. Probably out of fear of depressing the high price of their stocks, other Indian companies have undertaken joint ventures, strategic alliances, and relatively small, "tuck-under acquisitions" in niche areas across geographies to broaden their capabilities in setting up "near-shoring" facilities

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(local centers for clients that are not ready yet to outsource to distant locations) to serve their clients in the West. The presence of Indian companies in strategic consulting (management consulting or business process re-engineering) is negligible largely due to perceived inadequate intellectual property protection laws in India. [7] (Pradhan, 2004.)

Generally, Indian software companies have a long way to go before they can arrive at the product development, commercialization, and marketing stage. They continue to remain masters of processes involved in managing distributed work across geographies in a "flat" world, usually on a point-to-point basis. Achieving global status in hardware assembly work will call for substantial investments in physical infrastructure, which are not forthcoming in view of the large fiscal deficit and public debt in India. Currently, infrastructure investment in India amounts to only 6 percent of GDP or half of the Asian average and will continue to pose a serious bottleneck problem in the future (IMF Survey, 2005.)

By far the most important challenge that Indian software companies face in becoming truly global players is changing the mindset away from sustaining their cost/quality advantage via the "average revenue realized per employee" route to becoming "disruptive innovators" or "leapfrogging the competition and dislodging the entrenched market leaders." The leading Indian software companies have succeeded in becoming "low-end disrupters" based on their low-cost/high quality business models such as the Global Delivery Model. However, in order for them to remain competitive in the global market place in the long run, they need to move into "new market disruptions" or create new markets for their patentable innovative products where no such markets currently exist. [8]

So far, even the elite Indian software companies have shown few signs of becoming new market innovators and are quite content to be order-takers rather than innovators. They have focused on global service delivery models that emphasize delivery client value via integrating "packaged software' created initially by western multinationals. These "service-only" Indian companies have done very little software product innovation and have yet to develop software products that could sell in global markets. They have indeed developed "incremental" process innovations that are tailored to delivering low-cost services to local customers, particularly in the rural areas of India. However, breakthrough "disruptive" innovations with a global impact are still missing (Pradhan, 2003.)

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4 CONCLUSIONS

India's number one priority is to create employment for its unemployed educated youth. In the short run, there is no denying that the IT/ITES-BPO industry has created an employment base in India, with all its spillover benefits, that did not exist before. However, the outsourcing industry cannot possibly be expected to be a panacea for India's massive unemployment problem. In fact, this industry is caught in a "Catch 22" situation with respect to creating employment. The employment-creation prospects are the highest at the bottom of the "food chain", that is in the BPO/KPO segments. However, in order to satisfy client demands, as the Indian software vendors move up the value ladder to higher value-added services such as consulting, application management, networking, and the like, the need for labor in these higher-end services becomes less and less.

India needs export-led, labor-intensive manufacturing to create jobs for its vast masses of unemployed people. In other words, India needs to build products, not just deliver services. The Indian strategy of "leapfrogging" into the big league of advanced nations by exporting high-tech services without first going through the manufacturing export stage is unprecedented in history. But its long-term success remains to be seen in view of acute competition stemming particularly from China, and the fact that the industry will reach its maturity stage in the not-so-distant future. So far, even the elite Indian software companies have succeeded only in becoming masters of "incremental" process innovation and "low-end disrupters" based on their low-cost/high quality business models such as the Global Delivery Model. They have not been able to become masters of product innovation or "new market innovators" in creating new global markets for innovative products.

The high-end technological work being done out of India is essentially tailored to fit the needs of distant users implying little interaction with India's domestic economy. Still, there is no question that the organizational capabilities developed by the IT/ITES-BPO services sector can serve as a model for the rest of the Indian economy. The high-tech services sector has been less regulated and taxed than other sectors. This, coupled with liberalization and the consequent unleashing of the power of human capital, has catapulted India as one of the leading economic forces in the world, and certainly as the undisputed

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leader in services outsourcing. Thus, the success of the software industry has had a profound "demonstration effect" on the whole of India.

The challenge for India now is how to extend the global success of the outsourcing industry to the manufacturing, construction, real estate, retail, tourism, and infrastructure sectors of the economy, all of which are labor-intensive. In a nutshell, the challenge for India is to make high technology work for millions of unemployed Indians. Short of this, the contribution of this industry towards promoting economic development in India will remain questionable, and the industry will probably remain yet another elite enclave (with limited linkages to the rest of the domestic economy) enhancing the existing pervasive inequality in India.

5 REFERENCES

[1] Asian Development Bank. (May 2004). Basic statistics: developing member countries., *Economic Research Department.* Manila, The Philippines.

[2] Basu, K. (2004). The Indian economy: up to 1991 and since in Basu, K. (Ed.), *India's Emerging Economy*, The MIT Press, Cambridge: Mass., 23-24.

[3] Brown, D. & Wilson, S. (2005). *The black book of outsourcing: how to manage the changes, challenges, and opportunities*, John Wiley & Sons, New York.

[4] Confederation of Indian Industry (May 9, 2005*). India in the new knowledge economy*, New Delhi, India.

[5] D'Costa, A.P. (2004). The Indian software industry in global division of labor" in D'Costa, A. P. and Sridharan, Eds.). *India in the global software industry*, Palgrave McMillan, New York, Chapter 1.

[6] Department of Information Technology, Ministry of Communications & Information Technology, Government of India (2003-04; 2005-06). *Annual Report*, New Delhi, India.

[7] *IMF Survey* (February 21, 2005)., 40-41.

[8] Joshi,V. (November 16, 2004)., Myth of India's outsourcing boom", *Financial Times*., 21.

[9] *The McKinsey Quarterly* (2005). Can China compete in IT services?, 1.

[10] *The McKinsey Quarterly* (2005). Sizing the emerging global labor market., 3.

Revista Eletrônica de Negócios Internacionais da ESPM
http://www.espm.br/internext
ISSN: 1980-4865

[11] *The McKinsey Quarterly* (2005). Fulfilling India's Promise, Special Edition.

[12] Ministry of Finance, Government of India (2004-05, and 2005-06). *Economic Survey*, pp. 140-148.

[13] Murthy, N.R.N. (2004). The impact of economic reforms on industry in India" in Basu, K. (Ed.), *India's Emerging Economy*, The MIT Press, Cambridge. Mass., 217-222.

[14] Murthy, N.R.N. (2004). Interview. *The McKinsey Quarterly*, Special Edition, 2004.

[15] National Association of Software and Service Companies (NAASCOM) (2005, 2006). *Strategic Review*, New Delhi, India.

[16] NASSCOM (2004-05). *Annual Report.*

[17] NASSCOM (2004). Newsline. Development; Research; Feature, 32.

[18] Paul, V. (November 19, 2004). Dawn of an Indian century. Keynote speech at Wharton Global Conference, Philadelphia: PA.

[19] Pradhan, B. (October 23, 2003). Who needs products? Services are prime", rediff.com

[20] Pradhan, B. (2004). Building a disruptive business model in the market", Infosys Analysts Meeting, Bangalore, India.

[21] Prahald, C.K. & Krishnan, M.S. (September 2004). The building blocks of global competitiveness. *Optimize*, 22.

[22] Simpson, L. (August 6, 2004). Engineering aspects of offshore outsourcing and public policy investigation. *Washington Internships for Students of Engineering*, Washington, D.C.

[23] Singh, N. (2004). Information technology and India's economic development", in Basu, K. (Ed.), *India's Emerging Economy*, The MIT Press, Cambridge, Mass., 223-261.

[24] Vestring, T., Rouse, T. & Reinert, U. (Spring 2005). Hedge Your Offshoring Bets. *MIT Sloan Management Review*,46:.3,27-29.

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End Notes

[1]. The tier-1 Indian companies include Tata Consultancy Services, Wipro, Infosys, and HCL Technologies , while the tier-2 companies include companies like Satyam. Cognizant Technology Solutions is excluded from this analysis since it is a U.S.-based company with development centers in India.

[2]. These companies are: IBM Global/Daksh, Accenture, Hewlett Packard, MphasiS, Wipro Spectramind, ICICI OneSource, Sutherland Technologies, Hewitt Exult, HCL Technologies, Satyam, Northrop Grumman Information Technology, Infosys, Getronics, Spherion, i-Flex, Siemens Business Services, Datamatics, i-Gate, Perot, and Patni Computer. See Brown and Wilson, 2005, pp.159-163.

[3]. In terms of full-time employees hired in FY 2005-06, the top 10 BPO vendors in India were: Wipro BPO, Genpact, IBM Daksh, WNS, Mphasis BPO, HCL BPO Services, ICICI OneSource, Progeon, and ExI Service Holdings. See NASSCOM, "ITES-BPO Market: Facts and Figures", June 6, 2006.

[4]. The first-generation economic reforms, initiated in 1991, decentralized decision-making authority from the central government to regional and state governments, allowed software companies to raise capital through the equity market, introduced current account convertibility of the rupee, made access to foreign currencies easier (thereby promoting overseas travel, establishment of overseas sales offices, and hiring of foreign consultants), and allowed 100 percent foreign ownership of Indian subsidiaries (thus facilitating the entry into India of multinational companies.) Most software imports were brought under the Open General License Scheme, and the duty on software imports was eliminated. The corporate tax rate was reduced, and estate tax was abolished. The government also allowed Indian companies to list on foreign stock exchanges such as NASDAQ. Finally, the IT sector was exempted from labor regulations concerning working hours, and overtime pay. See Murthy, 2004, and McKinsey Quarterly, 2004 Special Edition.

[5]. The top 10 service providers in China control only 15 percent of the regional outsourcing market, compared with 45 percent market share for India's top 10 suppliers. China does not have brand names in the outsourcing industry whereas India has several, i.e., the top-tier Indian companies. Only 6 of China's 30 largest software companies are certified at levels four or five of CMM, while all of the 30 top Indian companies are certified at these levels. India's IT and ITES-BPO exports are generally double the amount exported by China. See The McKinsey Quarterly, (1), 2005, and Williamson, 2005.

[6]. See comments made by Nandan M. Nilekani, Managing Director of Infosys, in interview with a New York Times columnist in www. Infosys.com/media/playing_field.asp. Satyam maintains an overseas presence in 46 countries, Wipro in 35 countries, Tata Consultancy Services in 33 countries, Infosys in 17 countries, and HCL Technologies in 15 countries. See www.tcs.com, www.wipro.com, www.infosys.com, www.satyam.com, and www.hcltech.com

[7]. Computer software is protected by the Indian Copyright Act, which did not prohibit reverse engineering, thereby causing a great deal of anxiety to the outsourcing industry concerning piracy of intellectual products. Recently, an amendment to the Indian Patent Act has been proposed to protect software product. However, neither the Indian Penal Code nor the IT Act of 2000 deals adequately with emerging cyber crimes. See NASSCOM, Strategic Review 2005, pp. 172-173, and CNET News.com, June 29, 2005.

[8]. See the interviews with Clayton M. Christensen of Harvard Business School, and N.R. Narayana Murthy, Chairman and Chief Mentor of Infosys, in "Can Infosys be a Disruptive Innovator?" Business Standard, January 20, 2004.