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Knowledge Process Outsourcing: India's Emergence as a Global Leader

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Abstract

Technological progress and rise of knowledge industries have created new business opportunities in the global scenario. After low end business processing, global corporations have started outsourcing high-value added forms of business process outsourcing. This has given rise to a new trend in outsourcing, Knowledge Process Outsourcing, KPO. This includes research and work on intellectual property, equity and finance, analytics, market research and data management, etc. After achieving success in BPOs, India is now gearing towards KPO's. This sector is expected to employ 250,000 persons by 2010.This paper examines issues of Knowledge process outsourcing in terms of Hecksher Ohlin Model. It looks at emerging trends of KPO sector in India. It gives a perspective on India's advantages in KPO and its emerging potential for the economy. It also highlights challenges faced by the upcoming KPO sector. Policy implementations regarding challenges are also discussed.

Keywords: Knowledge workers, Knowledge process outsourcing, Comparative advantage, Hecksher-Ohlin Theory etc

1. Introduction

The present day world is witnessing a rapid change from an industrial to a knowledge-based economy. In the knowledge economy, there is knowledge intensity where efficient production relies on information and know-how. A highly skilled labour force is the key to success in the knowledge economy and knowledge industry (Skyrme 1997, Stiglitz 1999). The knowledge professionals involved in the knowledge economy are referred to as knowledge workers. Knowledge workers are those workers who have higher levels of education and their work is the output of their skills (Taylor 1998). Also in a knowledge economy, the sustainable comparative advantage of a country lies in its intellectual resources in comparison to its natural resources or cheap labour force (World Development Report).

The evolution and maturity of the Indian BPO sector has given birth to KPO or Knowledge Process Outsourcing. BPO is getting differentiated into strata based on the level of skill and knowledge required for the job. As global business is becoming more competitive, the cycle time for introducing products and services has become smaller. Customers demand high quality of services provided. In response, business enterprises adopted systems and business models that provide operational efficiency. Also, these business models also add strategic value to their products and services. Hence, many firms have started outsourcing their high-end knowledge work to low-wage destinations. This phenomenon is known as knowledge process outsourcing or KPO. Knowledge Process Outsourcing involves off shoring of knowledge intensive business processes that require specialized domain expertise (Evalueserve 2005, Sengupta 2005, Sen and Sheil 2006).

2. Knowledge Process Outsourcing

Knowledge Process Outsourcing refers to the outsourcing of high-end complex tasks and processes like market research, investment research, patent filing, legal and sourcing and information amongst others. It includes legal process outsourcing. These are both high-value-added forms of business process outsourcing (BPO). KPO firms provide domain-based processes and business expertise, rather than just process expertise. Firms gradually move from low end to high end outsourcing. The IT industry started from Programming and maintenance. It has gradually evolved to IT led business strategy. The Insurance industry has evolved to Underwriting and Asset Management from Contact centers and customer support.

Among the fast-moving verticals within the KPO space, Data Search, and Integration & Management are expected to witness the fastest growth, with close to 50% CAGR and hit a USD 5 billion market globally. Market Research and Business Intelligence sectors will also witness close to 54% CAGRgrowth. Few areas which are evolving but have high potential are Engineering & Design, Animation and Simulation Services, Paralegal Content &Services, e-learning, Biotech & Pharmaceuticals, Research &Development and Equity, Financial Services and Insurance Research. The central premise of a KPO is to create value for the customer by providing domain expertise rather than process expertise.

Technological progress and rise of knowledge industries have created new business opportunities in the global scenario. One major business opportunity is that of outsourcing. After low end business processing, global corporations have started outsourcing high-value added forms of business process outsourcing. This has given rise to a new trend in outsourcing, Knowledge Process Outsourcing, KPO. This includes research and work on intellectual property, equity and finance, analytics, market research and data management, etc. After achieving success in BPOs, India is now gearing towards KPO's. This sector is expected to employ 250,000 persons by 2010 (Evalueserve 2005). Hence, the rising KPO sector has major implications for the Indian Economy.

Outsourcing has significant impact on the Indian Economy. Though an important area, there is lack of relevant research literature in this field. Sargeant (2006) examined the existing outsourcing relationship literature and identifies areas of opportunity for study as customer vendor relationship. The study identified the importance of the customer vendor relationship as an indicator for successful outcomes in outsourcing. Jiang and Quereshi (2006) reviewed literature on outsourcing and provided roadmap of future research on outsourcing results using data from 1990 to 2003. They highlighted 3 major gaps and future research opportunities in outsourcing studies. These papers analysed conceptual aspects of outsourcing.

Bhattacharya (2005) studied challenges for Indian companies in financial services KPO services. This research paper was sector specific and discussed the challenges aspects only. Mehta et al(2006) identified managerial challenges and opportunities faced by business process outsourcing (BPO) firms in India. They interviewed executives in 15 BPO firms. Critical issues were human resources- and organization-related challenges. Knowledge Process Outsourcing was identified as a future opportunity.

Sen and Falguni (2006) studied issues related to knowledge process outsourcing from the client firm and the provider's perspectives. The issues are derived from five cases studied by the authors in India and Ireland.

Literature review shows that issues related to outsourcing have been highlighted. However, it is seen that not much research has been done regarding the contribution of KPO towards Indian economy and challenges faced. This paper looks into these issues. The key issues on which the paper would throw light are

1. Growing global trends in KPO as explained by Heckser Ohlin model

2. Emerging trends of KPO in India and areas of specialization

3 .India's advantages in KPO and its emerging potential for the economy

4. Challenges faced by the upcoming KPO segment

5. Policy implementations regarding KPO sector

3. Global outsourcing trends in KPO and its rationale

Outsourcing has been one of the major business trend of 90s. Outsourcing involves contracting with a supplier, this may or may not involve some degree of offshoring (wikepedia). Outsourcing of business processes lead to cost reduction of 80-90%, improved access to new technology and allowed a firm to focus on core competency. (Petrie 2000, EIU 1995). Cost savings, operational efficiencies, access to a highly talented workforce and improved quality are all underlying expectations in offshoring high-end processes to low wage destinations. The outsourcing firm focuses on broader business issues, or maintains a clearer strategic focus, while operational details are assumed by an outside expert (Petrie 2000; EIU/AA, 1995).

"Outsourcing," in a corporate context, represents an organizational practice that involves the transfer of an organizational function to a third party. The third party may be located in another country (wikepedia). Definitions of outsourcing vary and some examples are: "an arrangement where one company provides services to another company that would otherwise have been implemented in-house." (Skyes 2004).

Outsourcing involves the transfer of the management and/or day-to-day execution of an entire business function to an external service provider (Overby 2007). Outsourcing is "the transference to third-parties, the performance of functions once administered inhouse. Outsourcing is really two types of service: ITO (IT Outsourcing), involves a third party who is contracted to manage a particular application, including all related servers, networks, and software upgrades. BPO (Business Process Outsourcing), features a third party who manages the entire business process, such as accounting, procurement, or human resources." (Skyes 2004). Knowledge Process Outsourcing refers to the outsourcing of high-end complex tasks and processes like market research, investment research, patent filing, legal and sourcing and information amongst others.

Initially, global firms outsourced less skilled business processes to countries with a large pool of skilled labour. This phenomenon was known as BPO or Business Process Outsourcing (BPO). This is a business model where a company contracts out some functions to a service provider who delivers the outsourced function back to the company. BPOs consists of services like customer services, insurance, banking, mortgage and asset management. The sales turnover of top 100 outsourcing Companies in 2008 was around 1.7$ billion and employed 27,000 people (WNS 2008). The slowdown of US economy due to recession may further expedite the process of cost cutting resulting in increase in outsourcing to low cost nations.

India became a leader in this field of business process outsourcing, BPO. The contribution of BPO was 2.78 bn in 2003 and is expected to grow at a rate of 26% up to 2010 (Evalueserve 2005). Indian firms are figured high on list of outsourcing firms. In 2008, 20 Indian companies were placed in world's top 100 firms in outsourcing (WNS 2008). Outsourcing experience is attributed as the main strength of firms as Tech Mahindra and HCL Technologies.

4. Analysis of Heckscher Ohlin theory as a basis of Comparative Advantage in KPO Industries

The main proposition of Hecksher Ohlin model is a country exports those goods that use intensively its relatively abundant factor of production. That is, countries export those goods that they are best suited to produce, given their factor endowment. The Heckscher Ohlin model is used as a basis of comparative advantage in KPO industries. Heckscher-Ohlin asserts that differences in comparative advantage come from differences in factor abundance and in the factor intensity of goods. The Heckscher-Ohlin model ignores differences in Total Factor Productivity across industries and assumes that all countries possess the same production function in a given industry. If countries exploit their comparative advantage in production and trade, there can be specialization in the production of goods in a specific sector, though the specialization does not need to be complete. There are several economic theories, which analyze comparative advantage and patterns of specialization. Hechscher-Ohlin explains a comparative advantage in production through comparing a country's relative endowment of production factors in the economy within and across countries. A country will produce goods using the abundant factor most intensively in production, which can lead to specialization in a specific sector. (Kindleberger)

Different countries have different factor endowments that stem from their inherent geographic, historic and cultural heritage. Knowledge industries are typically intensive in skilled labour and educated manpower. Therefore what matters for a country's comparative advantage in knowledge industries is its resource base in terms of skilled and educated manpower or human capital. To assess this, there is a need to study the endowment of human capital in developing nations. India is a labour Intensive country. India has largest pool of manpower, which is capable of efficiently serving the KPO
industry. The country produces more than 3 Million graduates annually. India enjoys
the 2nd biggest reservoir of scientists, managers, and engineers in the world. In India, large numbers of people have an access to quality education but at the same time they get low salary as compared to their counterparts in other developed countries. This led the professionals to move to other developed countries. A large base of human capital along with low salaries is clearly what is going to determine the direction of knowledge process outsourcing.

5. Value proposition for KPO

Outsourcing creates value for both clients as well as vendors. Before outsourcing, the revenue breakup of a typical management-consulting firm in the US consists normally 20 percent fixed cost, 60 percent variable cost and 20 percent is profit margins

After outsourcing, the costs are 18 percent fixed cost, 30 percent variable cost, 20 percent is profit margins. This leads to savings, which is value creation of 32 percent for 'clients' of KPO firms. This increases competitiveness of firms. The variable cost of the client becomes the revenues for the KPO vendors. 30 percent of the revenues of a typical KPO vendor is profits (before taxes). Employees' costs constitute around 35 percent of the revenues. The balance, i.e., 35

percent of the revenues, comprise overhead costs, such as telecom, transport, catering, infrastructure costs, etc., of the KPO vendors This leads to a multiplier effect for profit and employment generation (Evalueserve 2005).

Shortage of highly skilled labour in developed countries is leading to outsourcing. More and more companies are turning to India for offshoring. Shortage of manpower can be solved through outsourcing. Fig 1 shows demand and supply of US labor in 2010. It is seen that there will be excess demand for labor of 5.6 million in 2010. This gap will be partially filled by offshoring of 1.3 million jobs (Evalueserve 2005).

Apart from cost cutting and corresponding saving that are accrued, companies are offshoring their services as to take advantage of the low wage structure in some countries. This helps them to reduce costs. Outsourcing also helps to take advantage of the time zone differences to enhance flexibility (such as adding another shift of work). This brings products and services faster to the market. A large and better talent pool can be accessed. Offshoring also occurs due to the need for product or service localization (Pandey et al 2004).

The Indian KPO sector has immense opportunities for the SMEs. The SMEs can change their costs as per the short-term demands, which can create new business models. Outsourcing presents opportunities for small and medium enterprises. Small firms find outsourcing relatively easy. Many external services are already being outsourced and help achieve economies of scale.

6. Contribution of KPO towards Indian economy

India has a trained army of chartered accountants, doctors, MBAs, lawyers and research analysts which will enable it to get a major share of global KPO business.

The KPO industry has tremendous potential for India. The KPO sector in India employed around 25,000 people in 2003 and generated total business worth $720 million. (Table 1).By 2010, it is expected to be worth a $14 billion business employing 250,000 people in India (Evalueserve). The growth rate in this sector is very high, 45% in KPO as compared to 26% growth rate of BPO. In 2003-04, the knowledge process offshoring (KPO) business was worth $720 million out of the total business process outsourcing (BPO) work of $3.6 billion. By 2010, KPO is expected to grow to $12 billion, while the entire outsourcing industry will be worth $18 billion. The value added per employee in KPO is expected to be $4,8000 as compared to $ 21950 in BPO in 2010. KPO will contribute 1.8% to the Indian service sector by 2010 as against 0.24% in 2003

7. Skills required in Knowledge Process Outsourcing

The demand for manpower in KPO is very specific focusing on educational qualification as the work involves specialised knowledge. Work includes abstraction of technical patents, extraction of legacy technical data, cataloguing and indexing, taxonomy building and database creation and updating. Table 2 shows the lists of the prominent KPOs and the skills required. All this requires a basic interest and knowledge in specific domains besides an aptitude for working with data and information. These processes demand advanced analytical and specialized skill of knowledge workers. Table 4 shows the India's strength in various segments of KPO.

Companies have a cut-off for marks (grades), depending on the kind of domain knowledge required for the particular project. The works also requires people to have a right aptitude and attitude for doing research-oriented work. After recruitment, the candidates are trained in various skills. Besides this, the candidate should possess good communication skills, should have an aptitude towards programming, should be able to work in a team, under pressure and different shift timings (Manu, 2005).

KPO is a lucrative career option for upcoming knowledge professionals. KPO sector offers a good working atmosphere with global exposure and an opportunity to develop skill sets in a specialised field. The remuneration is high as a person with about two years experience can draw a pay packet of around Rs 6 lakh (Rs 600,000) to Rs 8 lakh (Rs 800,000) annually, while an experienced professional gets anywhere between Rs 15 lakh (Rs 1.5 million) and Rs 20 lakh (Rs 2 million). The average annual salary in the Indian KPO sector is currently around $8000 per annum as compared to $6000 per annum in BPO (Manu 2005).

Companies like Evalueserve, GE Caps, MarketRx have set up KPO in India. Evalueserve has set up a center in Gurgaon. Law firms such as Patent Metrix, Cantor-Colburn and Schwegman, Lundberg, and Woessner & Kluth have set up offices in India. Pharma majors Astra Zeneca and GlaxoSmithKline have set up drug discovery centres at low-cost destinations to boost their research and development activities. For R&D in software and chip design, major telecom and IT companies opt for India. Motorola, Intel, IBM, Cisco, Texas Instruments, Nokia and Philips have set up offshore design centres in India. Microsoft has opened its R&D centre in Bangalore. Some US law firms have set up their captive centres in India. Others are collaborating with Indian firms for the same. GE has a 2,000 strong workforce at its research centre in Bangalore. Efunds has more than 80% of its work force in India. For Evalueserve, out of 650 employees globally, 600 are based in India itself.

8. India suitability for KPO

This evolution needs to be understood from the perspective of the strengths of India as a destination--and driver--of the KPO phenomenon. Analysts put cost advantage; incidentally one of the most significant drivers of KPO, from a KPO assignment at 50percent.Another critical driver is the deficit of skilled human capital in developed countries like the USA and UK. It is expected that, by 2010, there will be a shortfall of 5.6 million skilled professionals in USA, and 700,000 in UK. This, coupled with the cost advantage, has resulted in high-annualized growth in the KPO business.

8.1 Offshoring attractiveness index

India is considered a very suitable location for KPO. India ranked the highest score in terms of location attractiveness Index. As per AT Kearney 2004 survey, India ranked the highest position in offshoring attractiveness index due to low costs and people skills and availability.

A cross-country analysis in Table 3 shows comparison of India with other offshoring destinations. India main competitors are countries as Russia, China, the Czech Republic, Philippines, Ireland and Israel. India has the twin advantage of a large knowledge base and lower costs. India's main strength has been the English language education system. Also, India has a favorable demographic picture with a majority of workforce belonging to the younger age group. Philippines, Ireland and Israel have small talent pools while Chin and Russia have non-English speaking population.

Table 4 shows some segments where countries have built capabilities. Several countries are now trying to build capabilities in specific KPO areas. Russia claims to be a good destination for healthcare- and technology-related KPOs. The Philippines has established itself as a successful animation-outsourcing destination.

8.2 India's Education System

India's education system is its main strength in KPO. Indian ancient education system was very scientific. The British developed a strong English speaking based education, which helped India to have a comparative advantage. The tertiary level of education system is well developed in India. There is a pool of highly skilled labour. Indians have a good aptitude for R & D. Low cost advantage due to currency value also is a major advantage. India is a democracy, so is US. The similarity between two countries is also an advantage.

The huge talent pool, low cost and strong research infrastructure attract many MNC to set up R&D centres in India. These R&D centres are beneficial to both developing and developed countries. India has the world's largest number of scientific and technological personnel after USA. In India, six times more people go to universities than in China.

The supply of manpower comes from people from diverse backgrounds. Engineers, MBAs, professionals with financial background and even journalists are qualified to work in KPO. People with science background have a better chance, as some tasks require data analysis and programming. India's strong education background provides a large pool of knowledge workers in various sectors as Pharmacy, Medicine, Law, Biotechnology, Education & Training, Engineering, Analytics, Design & Animation, Research & Development, Paralegal Content and even Intelligence services.

India's has a strong education sector. The number of colleges for professional education was 886 in 1990-91, which increased to 3201 in 2004-2005. As seen in Table 5, in 2004-05, it was estimated that there were 407 Universities, deemed universities and institutions of national importance. There were 136 research institutions, 1302 engg, tech & Arch colleges and 817 medical colleges. There were 2431 institutes of higher learning, which included law, Management, MCA/IT, Agriculture etc. Enrolment figures show that there were 55352 students enrolled in PhD/ DSc/ DPhil, 696609 students in BE/ Bsc(engg) / B. Arch and 256748 students in medicine.

8.3 Deteriorating share of BPO

In BPO, rising labour wages have led to rapid costs increase. In BPO, Indian salaries have increased at an average of 14 per cent a year (Evalueserve analysis). If this trend continues, they will increase by 2.5 times the current salaries (in constant dollars) by 2010, thereby reducing the cost-arbitrage benefit from the present 40 to 25 per cent. India may have become too costly to provide low-end services at competitive costs (Dash & Agarwal2005). Low-end services may move to cheaper destinations like Ukraine, Belarus and Malaysia. Commoditisation of BPO services will further boost the transition of present low-end destinations to the higher end of the value chain. Hence companies have to move from bpo to kpo to move up the value chain. As companies will get higher returns, they will prefer to shift to KPO

9. Most probable areas of KPO

1. Off shoring R&D in pharmaceuticals and biotechnology is another area where there is enormous potential for KPO. Aggarwal says destinations such as India offer significant cost advantages (as much as 40 to 60 per cent) in the areas of contract research and clinical trials. Companies such as AstraZeneca and GlaxoSmithKline have recently set up drug discovery centres at low-cost destinations to offshore R&D activities.

2. Chip design and embedded systems is another critical area. The reason why all major integrated design manufacturers such as Motorola, Intel, Analog Devices, National Semiconductor, IBM, Cisco, Cypress Semiconductor, Nokia and Philips have set up offshore design centres is simple. The compensation for a chip design engineer with a master's degree and five years' experience is about $7,000 a month in the US. An engineer with the same qualification and experience in India gets about $1,200 a month.

3. Data-mining services companies can save as much as 60 to 70 per cent on analytics and inventory management costs by off-shoring them. The cost differential between Pills/engineers in the US and India is almost $60,000 to $80,000.

4. The cost differential between PhDs/ engineers in the US and India is almost $60,000 to $80,000.Companies like Evalueserve, GE Caps, MarketRx have set up centres at low-cost destinations to provide these services. And more are expected to follow soon.

10. Challenges faced by KPO

KPO sector has a lot of potential for growth in India. However, India faces a number of challenges to establish itself as a global KPO leader. The major challenge in setting up a KPO will be to find talented workers. There are two main issues, quantity of knowledge workers and quality of knowledge workers. MBAs, CAs, PhDs and doctors with super specialization will be in demand. There should be a balance between demand and supply of knowledge workers. The gap between supply and demand needs to be filled.

To maintain a continuous supply of knowledge supply of knowledge workers, more education institutes are required. However, opening up new institutes of higher learning is accompanied by a set of problems. A major problem faced by education system is getting good faulty members. Lack of good faculty members is a problem faced by all institutes, including IITs and IIMs. Retention of high quality faculty is a major challenge. Wide differences in salaries between industry and academia lead to exit from academia to industry. Development of good faculty members is a major challenge.

The quality of knowledge workers is also a major challenge. The employability of people passing out from our education system also needs to be examined. It is seen that a large number of students graduating from our education system are not employable by industry. The quality of knowledge workers need to be maintained. For this, the education system needs to be revamped. Courses should be developed which cater to specific demands of KPO.

KPOs require understanding of how a client works. The contracts in the KPO industry will be of much shorter duration. They may range anywhere from three weeks to six months. So, delivering high quality work will be the major aim. The major challenge lies in the process of developing KPO capability to deliver this high quality work.

KPO businesses involve high risk and confidentiality and most of the work would be outsourced from the US. The sector also requires higher level of control, confidentiality and enhanced risk management. Proper framework for BPO taxation and data security laws is a must.

KPO also faces attrition, as it is difficult for companies to retain talented and trained people. With higher pay packages and perks, people change jobs very frequently. Many people are still reluctant to join as they feel it is an unstable career. Many are unaware of the potential of this sector and the scope of future prospects. There is a lot of scope for teachers as this sector offers a good pay package. The challenge lies in making people accept KPO as a high potential sector.

11. Conclusions, Policy Implications and Recommendations

This paper examines the prospects and challenges faced by KPO sector in India. As mentioned above, the KPO industry is a booming sector in India. It is expected to grow 45% in size by 2010. There are many areas in which India will specialize. India is expected to be a world leader in KPO. The contribution of KPO will be substantial in terms of employment and revenue generation. India is already established itself as a world leader in IT. Becoming a world leader in KPO will help India a long way in becoming a global superpower.

This paper highlights not only the future prospects but also addresses the impending challenges looming ahead. India's strength lies in its large pool of trained manpower available at low cost. As in case of software sector, the main input in KPO is high levels of human capital. India's strong education has led to creation of high levels of human capital. However, it faces a number of challenges. The education sector needs to be examined to maintain a balance between demand and supply of knowledge workers. Also, the quality of higher education also needs to be examined. Our education system produces a large number of degrees. Whether these degrees will suffice for KPO is also an issue, which needs to be examined. The employability factor of a large number of graduated produced from out system is also an issue which require attention. Both issues of quality and quantity of knowledge workers need to be looked into.

The education system needs to be expanded. As proposed, the government plans to set up 15 more IITs and IIMs. It is proposed to establish 16 central universities. Some institutes have already started functioning as an IIM in Shillong, 3 IISERs in Mohali, Pune and Kolkota and IIIT in Kancheepuram. The budget 2008-2009 has allocated special funds for setting up institutes of higher learning. In the budget 2008-09, there are provisions for setting up 3 IITs in Andhra

Pradesh, Bihar and Rajasthan, 2 IISERs at Bhopal and Thiruvananthpuram and two schools of planning and architecture at Bhopal and Vijayawada. More institutes of higher education will be set up in the Eleventh plan period. The government already accepted the recommendation of knowledge commission as to inter-connect knowledge institutions through an electronic digital broadband network.

For a large section of higher education, stress has to be laid on skill formation and not an ornamental degree. Care should be taken to provide holistic education, which imparts proper values, analytical skills and learning. Stress should be given on development of faculty members who will be grooming the future knowledge workers. Premier institutes are facing faculty crunch. Salaries of faculty members have to revised and made on par with industry salaries. This along with proper incentives will make academia a attractive proposition for talented people. There should be sufficient integration between academia and industry to provide a right balance for up gradation of curriculum to keep in tune with the requirements of industry. Steps should be taken to provide special education in areas where KPO growth is expected to be high as Market Research. Specialization courses at postgraduate level for these areas should be developed. From the industry side, suitable steps should be taken for retention of talented knowledge workers.

Another important point to be mentioned here is with respect to recession in US Market. The impact of recession on Knowledge Process Outsourcing should also be assessed. Many feel that the recessionary nature of today's economic climate will promote the adoption of increased outsourcing. However, the value of Indian Rupee especially when compared to the US Dollar is making Indian KPO companies more competitive as per market forces.

India has a bright future in KPO. India has comparative advantage in knowledge work. Care should be taken so that our comparative advantage is not reduced. Other countries may try to develop their skills which will erode our advantage. If the above discussed challenges are addressed in the proper manner, India will definitely retain its supremacy in human capital and emerge as a world leader in KPO.

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Table 1. Contribution of KPO towards Indian economy

Service	**Employment opportunity by 2010**	**Revenue generation**	**Value added per employee**
BPO	820,000	$ 39.8 billion	$ 21950
KPO	250,000	$ 12 billion	$ 4,8000
Service	**Employment opportunity by 2003**	**Revenue generation**	**Value added per employee**
BPO	171,000(ITES – bpo)	2.68 bn	15672
KPO	25,000	720 million	28880

Source: Calculations based on Evalueserve analysis

Table 2. Lists of the prominent KPOs and the skills required

Segments	**Services**	**Skill sets required**
Legal services	Reviewing transactional & litigation documents; drafting contracts; research memoranda & due diligence reports; prosecuting patents; negotiations	Knowledge in US/UK laws; adept in legal application; ability to reason & research
Engineering R&D	3D modeling; conversion: 2D to 3D; finite analysis; computational fluid dynamics analysis; technical specifications for tenders; value engineering	CAD/CAM; drafting & modeling; product design
Market research & analytics	Secondary & primary research; conversion of findings to knowledge; writing & editing; formatting client reports	Statistical tools; research techniques; report writing & presentations; database research
Writing & content development	Editorial; content delivery; digitization of content; data enrichment & warehousing; pre-press work; proofreading; template designing; text composition	English communication skills; journalism; experience in writing
Pharma R&D	Research & development; drug discovery; clinical research	Doctors; master's degree in science, PhDs
Healthcare services	Diagnostic; genetic profiling; oncology tests; HIV & allergy	Medical degree; specialized subject knowledge
Education & training	K-12; private tutors; curriculum design; pedagogy; content development	Teaching methods/ techniques; cultural sensitivity; online teaching methods

Source: *Sathe & Aradhana,Sourcingmag.com*

Table 3. Main destinations for offshoring IT destinations (until March 2003)

Parameter	**India**	**Canada**	**Ireland**	**Israel**	**Philippines**	**South Africa**
IT export industry size (US $ mn)	8955	3780	1920	900	640	96
Active export focused IT professionals	195,000	45000	21000	15000	20000	2000
IT employee cost (US $ per yr)	5000-12000	36000	25000-35000	25000	7000	18000
IT labor force	Low cost, high quality	High cost, high qua	High cost, high quality	High cost, high quality	Low cost, moderate quality	Moderate cost, moderate quality
Infrastructure	Average	Good	Good	Good	Good	Good
Main positives	English language, abundant skills	Near shore USA	Large development centres	More shrink wrapped software	English language, cultural similarity	Language skills
Main negatives	Infrastructure	High cost	High cost	Regional unrest	Less project managers	New BPO industry

Source: *Evalueserve, Nasscom*

Table 4. Countries capability in particular segment

Segment	**Country**
Animation	Philippines, India, China
Content	India, Philippines
Financial services	India, China
Healthcare	Russia, India
IT/R&D	India, China, Russia
Legal	New Zealand, India
Pharma	India, Russia

Source: *Sathe & Aradhana, Sourcingmag.com*

Table 5. Education in India in 2004-05

Institution	Number
Universities etc	407
Research institutes	136
Engn, tech, Arch	1302
Medicine	817

Source: *Selected Educational Statistics 2004-05*

Table 6. Market potential for outsourced non-IT services (2008)

Service	**Potential (In billion Dollars)**
HR Service	44
Customer interaction services	33
Data Search, integration and management	18
Finance and accounting	15
Remote education	15
Other including pharmaceutical and research and development	8
Engineering and design	5
Medical Content and services	1
Legal Content and services	1
Translation, transportation etc	1
Total	141

Source: ScienceTech., 2007.

Table 7. Prominent KPO segments and players in India

Segment	**Leading companies in space**
Research/analytics	Evalueserve, SmartAnalyst, Netscribes, ValueNotes, Ugam Solutions, marketRx, Inductis, Allsec, Scope eKnowledge, Copal Partners, Pipal Research
Legal research	Pangea3, Atlas Legal, Manthan Services, Intellevate
Finance & accounting	Outsource Partners International, Sureprep, Karvy
Pharma/Biotech research	Biocon, Avesthagen, Eli Lilly, Saintlife, Pfizer, Bayer, AstraZeneca, GlaxoSmithKline, Novo Nordisk
Clinical research	Clingene, Avesthagen, Ranbaxy
Telecom R&D	Alcatel, Nokia, Qualcomm, Ericsson, Lucent Technologies
Software R&D	Microsoft, Google, Baan, Yahoo, Adobe, SAP Labs, BMC Software, IBM, HP, Phillips, Sun Microsystems
Chip design	Cisco, Intel, Texas Instruments, Motorola, AMD
Auto/engineering	Delphi, DaimlerChrysler, General Motors, Whirlpool, Neilsoft, Plexion, Quest
Publishing	TechBooks, Thomson Digital, Macmillan, Knowledgeworks Global, Newgen Imaging
E-learning	Brainvisa Technologies, NIIT Smartserve, Lionbridge, Tata Interactive Systems, Maximize Learning
Animation	Pentamedia Graphics, Crest Animation Studios, DQ Entertainment

Source: Sathe & Aradhana, Sourcingmag.com

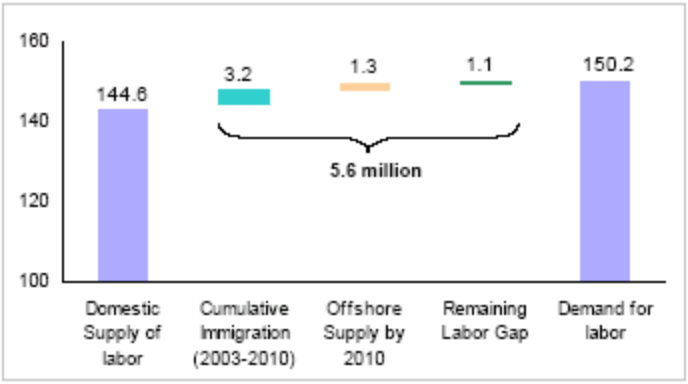

Figure 1. Situation of Demand and Supply of US Labor in 2010 (in Millions)

Source: *Pandey et al 2004*