Ensuring India's **offshoring future**

The country must not only produce more top-quality engineers but also show the world the depth and quality of its talent in other fields—and in cities beyond Bangalore and Mumbai.

Diana Farrell, Noshir Kaka, and Sascha Stürze

India's offshoring sector, the world's largest and fastest growing, is dominated by IT services, which play a major role in the country's overall economic growth. In 2004–05, the Indian offshore IT and business-process-outsourcing industry will generate approximately $17.3 billion in revenues and employ an estimated 695,000 people. By 2007–08, that workforce will consist of about 1,450,000 to 1,550,000 people, and the industry will account for 7 percent of India's GDP.[1]

Baiju Parthan
Pigment ink print on
aluminum composite
182.2 × 71 cm
2004

Yet clouds are gathering on the offshore horizon. Research by the McKinsey Global Institute (MGI) shows that India's vast supply of graduates is smaller than it seems once their suitability for employment by multinational companies is considered.[2] In the country's most popular offshoring locations, such as Bangalore, rising wages and high turnover among engineers—the professionals most in demand for IT services—provide evidence that local constraints on the supply of talent already exist. And just as these bottlenecks are developing, other low-wage countries, such as China, Hungary, and the Philippines, are gearing up to challenge India's lead.

---

[1] *Strategic Review 2005*, National Association of Software and Service Companies (Nasscom).
[2] See the full report, *The Emerging Global Labor Market*, available free of charge at www.mckinsey.com/mgi; or Diana Farrell, Martha A. Laboissière, and Jaeson Rosenfeld, "Sizing the emerging global labor market," *The McKinsey Quarterly*, 2005 Number 3, pp. 92–103 (www.mckinseyquarterly.com/links/18754).

Article at a glance

India's lead in offshoring stems from its pool of well-trained, low-cost engineers for IT services.

——

That pool is smaller than it appears, and there's a risk that it may run dry in the most popular offshoring locations.

——

For offshoring companies, India's weak infrastructure is its most unattractive feature.

——

India's policy makers must improve the quantity and quality of its graduates, strengthen its infrastructure, and disperse offshore demand for talent to second-tier cities and services other than IT.

But the end of India's offshoring bonanza isn't necessarily at hand. India has other attractive qualities beyond low-wage professionals for companies that want to offshore their operations. In 15 years of offshoring, the country has developed a stable of world-class IT services vendors that can save foreign companies the trouble of setting up their own offshore centers. And it has a large supply of qualified talent in areas outside IT, such as R&D, finance and accounting, call centers, and back-office administration.

Still India's leaders have to ensure that a company hunting for an offshoring location doesn't turn to other countries: the government must not only adjust the country's educational policies to ward off the looming squeeze on talent but also invest more money in infrastructure. So far, offshoring has been largely a private-sector affair, and in some respects the lack of government involvement has been the secret of its success.[3] But private-sector investment in air-conditioned offices, apartments, and shopping malls in offshoring centers has not been matched by public investment in airports, roads, and utilities—improvements necessary to enable the millions of people attracted to these locations to live and work more efficiently. From now on, government and business must work together if offshoring is to remain India's growth engine.

How deep is India's talent pool?

India's pool of young university graduates (those with seven years or less of work experience) is estimated at 14 million—the largest of all 28 countries MGI has studied. It is 1.5 times the size of China's and almost twice that of the United States. This huge number of young graduates is topped up by 2.5 million new ones every year. As in other low-wage countries, however, only a fraction of these people are suited for work in multinational companies.

We interviewed 83 human-resources managers at multinationals that look for talent in the emerging world. Those with experience in India praise the cultural fit and work ethic of their Indian employees but would still, on average, consider employing only 10 to 25 percent of the country's graduates—a higher proportion of suitable graduates than China produces

---

[3] Diana Farrell and Adil S. Zainulbhai, "A richer future for India," *The McKinsey Quarterly*, 2004 special edition: What global executives think, pp. 26–35 (www.mckinseyquarterly.com/links/18755).

but only half that of Central Europe. The proportion of suitable graduates also varies by field of study: just 10 percent of the Indian students with generalist degrees in the arts and humanities are suitable, for example, compared with 25 percent of all Indian engineering graduates.[4] Nonetheless, the proportion of suitable engineers in Central Europe is twice as high.

Why is the average level of suitability so low? The answer, largely, is that the quality of India's universities varies a great deal. Graduates of the top schools, such as the seven Indian Institutes of Technology (IITs) and the six Indian Institutes of Management (IIMs), are world class, but elsewhere the level of quality declines steeply.

One problem is poor English. Although it is an official language in India, not every graduate speaks it well enough to work for the multinationals or for the Indian vendors that serve them. Graduates from certain regions appear to be handicapped by strong local accents that don't lend themselves to jobs in call centers and other workplaces requiring interaction with foreigners. Some companies have relocated call centers from India to the Philippines (where people tend to speak English with an accent closer to that of the US population) because customers complained that they couldn't understand the operators. Even HR managers in software and IT services firms rank language problems as one of the top three handicaps of engineering applicants.

High rates of emigration among graduates of the top schools further depress local supplies of suitable talent. An estimated 40,000 IIT graduates, for example, have gone to work in the United States, though India's buoyant IT services sector is now said to be attracting many of them back.[5] Another hitch is the fact that the country's domestic economy is still largely shielded from global competition, so few older graduates or middle managers have the international experience to switch to the multinationals.

A looming shortage of talent

In India only 1.2 million people hold engineering degrees—4 percent of the total university-educated workforce, as compared with 20 percent in Germany and 33 percent in China. Combined with the generally low level of suitability among Indian graduates, this means that India could face an overall shortage of engineers in the next few years, with a particular squeeze in certain cities. Wages for India's graduate software engineers have already risen steeply in the most popular offshoring destinations, such as Bangalore and Mumbai.

The country does have a growing number of people who hold engineering diplomas (degrees from three-year rather than four-year programs):

[4] Graduates in all engineering disciplines except civil and agricultural engineering.
[5] Oliver Ryan, "India's top export: Headed back home?" *Fortune*, June 13, 2005.

1.75 million in 2003–04, increasing by 130,000 people a year. Diploma holders are not as highly trained as graduates but can fill gaps at the less creative end of the IT value chain. Yet even they will not be sufficiently numerous to alleviate the coming shortages. Our forecasts show that demand for India's young professional engineers is likely to exceed supply by 2008 if current rates of growth in demand (especially from the United Kingdom and the United States) persist. Significant shortfalls of talent are also expected in the field of business process offshoring, driven by the likelihood that demand and job growth will increase much faster in this industry than they will in IT services over the next three to five years.

The talent squeeze is already beginning to affect the top cities in India, and Hyderabad's recent history shows how fast hot spots can become overheated. The city became a hub for software and IT in the 1990s, when large IT-outsourcing services firms, such as Satyam and Tata Consultancy Services, established themselves there. At least 20 major Indian and US software vendors have set up large engineering centers in Hyderabad since 1998. Activity ballooned after 2002: six new centers, with a total of about 5,000 employees, were established in 2004 alone. Local supplies of suitable candidates for most occupations are ample. But universities and colleges in the Hyderabad region graduate 25,000 engineers a year, which will not be enough to satisfy the demand at current growth rates if only 25 percent are suitable for employment in multinationals. As early as 2006, the demand for suitable engineers will surpass the local supply; by 2008, we reckon, demand will hit 138 percent of supply.

Even so, India's graduates are highly mobile compared with those from other emerging markets. Companies may therefore find that they can easily attract suitable engineers to Hyderabad (in the state of Andra Pradesh) from the country's other cities. Andra Pradesh has been expanding its tertiary-education system unusually quickly since 2001, and the fruits of that expansion have only just begun to reach the labor market. Furthermore, both the state government and local companies are working to improve the suitability and quantity of local graduates and diploma holders. Taking all this into account, Hyderabad may have enough suitable engineers to put off the labor squeeze for a few years beyond 2008. All the same, five years ago no one expected Bangalore and Mumbai to experience the talent shortages they face now. Hyderabad's authorities and companies are right to focus on stepping up the local supply of suitable engineers.

In the country as a whole, middle managers are also becoming scarce. Although India has more of them than other offshoring destinations do, the country also has higher demand because the offshoring sector has grown

so fast: over the past decade, the number of middle managers it employs has expanded by more than 20 percent a year, and even more briskly in some cities. New entrants often lure qualified managers from existing businesses instead of training their own. Sometimes they poach across borders as well—Russian entrepreneurs, for example, have hired middle managers from India. Rapidly rising remuneration is evidence of their scarcity. Annual wages for project managers in India's export-oriented IT sector, for instance, have increased, on average, by 23 percent annually over the past four years, while the salaries of programmers have risen by 13 percent (Exhibit 1).

Improving India's offshoring prospects

How can India stay on top of the offshoring ladder? A number of longer-term policy actions must be taken if the country is to remain attractive to companies that want to move their operations offshore—and fixing those aspects of its notoriously weak infrastructure that can hamper a company's efficiency is just one. But in the short term, the priorities for Indian policy makers and for senior managers at companies seeking to offshore operations to India are the squeeze on IT and business-process-outsourcing talent in the offshoring hot spots and the looming general shortage of engineering talent.

Raise the quality of university education

To preempt the impending shortage of talent and to increase the supply of graduates suitable for offshoring in general, India must bring more of its fast-growing multitude of graduates up to the level of quality that multinational employers require. Raising the mediocre universities to the standard of the very best will be a tough and lengthy job. Private providers, such as the
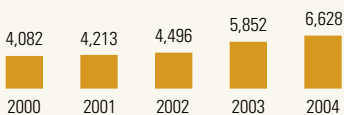
EXHIBIT 1

On the rise

Annual wage, $

Entry-level software developer

Compound annual growth
rate, 2000–04 = 13%

2000	2001	2002	2003	2004
4,082	4,213	4,496	5,852	6,628

Project manager

Compound annual growth
rate, 2000–04 = 23%

2000	2001	2002	2003	2004
13,585	14,653	16,319	25,822	31,131

Source: *Strategic Review 2005*, India's National Association of Software and Service Companies (Nasscom)

university-affiliated software-engineering schools of Oracle and Satyam, have driven an explosion in the number of graduates in IT-related disciplines; both private providers and government-funded institutions have contributed to the increasing number of potential candidates for business process jobs.

The central government's policy makers can play an important part in raising standards, by defining curriculums that reflect current and future demand in employment. India's state authorities can help by developing better certification procedures and promoting higher standards of quality for colleges. Both tiers of government could support the expansion of top-quality private schools.

Companies too can play a role. Private initiatives and joint efforts by companies and universities have helped raise the quality of talent elsewhere in the developing world. In Russia, for instance, associations of software businesses have provided practical management education for engineering students. A recent report from India's National Association of Software and Service Companies (Nasscom) proposed an agenda for improving the suitability of the country's graduates. The agenda included strengthening the collaboration between industry and educational institutions in defining curriculums as well as establishing an IIT in every Indian state.

The vast majority of India's estimated 14 million young university graduates hold generalist degrees, the least attractive ones for multinational employers. Offering grants to study the disciplines—especially engineering—that these companies most covet could also help to raise the proportion of suitable graduates.
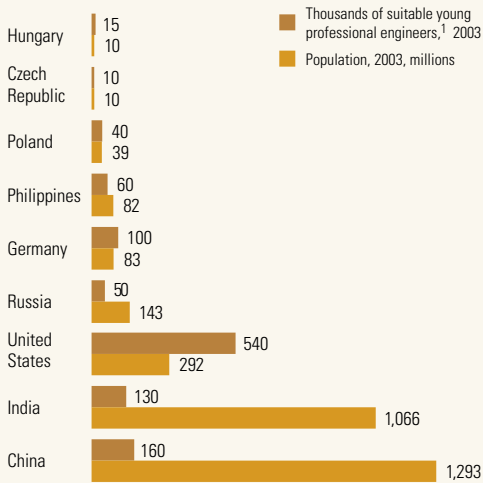
Move beyond offshoring hot spots

Wage inflation and high attrition rates in key offshoring locations are understandably making companies nervous about India's supply of talent. But these problems are confined to specific occupations and cities. To some extent, moreover, offshoring companies have created difficulties for themselves by crowding into the same places. Although clustering creates advantages at first, they soon dissipate if demand for talent overwhelms the supply and if infrastructure investments don't keep pace.

Policy makers should encourage companies to look for talent in cities that haven't been touched by the offshoring bandwagon, where cheap supply may well exceed demand. India has huge numbers of skilled graduates in disciplines other than engineering. What's more, MGI research shows that it has the lowest labor cost for university-educated employees of the 16 potential offshore countries we studied (roughly 12 percent of the US cost, on an hourly basis). India's graduates also work the longest hours—on average,

EXHIBIT 2

Size can be deceptive

	Thousands of suitable young professional engineers,[1] 2003	Population, 2003, millions
Hungary	15	10
Czech Republic	10	10
Poland	40	39
Philippines	60	82
Germany	100	83
Russia	50	143
United States	540	292
India	130	1,066
China	160	1,293

[1] With ≤7 years' work experience; includes all engineering disciplines except civil and agricultural engineering and all IT and computer science degrees.

Source: Interviews with human-resources experts; Global Insight; ministries of education/labor statistics offices for countries shown; McKinsey Global Institute analysis

2,350 a year, as compared with 1,900 in the United States and 1,700 in Germany.

Although India's graduates are more mobile than those elsewhere, our estimates show that one-fifth of them still aren't easily accessible to multinationals or Indian service vendors. Indeed, roughly half of the country's graduates study in cities with no international airport. Inaccessibility is a genuine threat to India's offshoring supremacy; our study of supply conditions in 28 low-wage countries shows that many smaller ones have much larger pools of suitable graduates than the size of their populations would suggest (Exhibit 2).[6] India's policy makers must make a priority of helping companies to avail them-selves of the country's untapped pockets of supply before too many more of them discover the charms of other offshoring locations. The government may, for instance, have to build airports in less well-known cities and help them with their marketing. Companies exploring these second-tier cities could consider telecommuting as a way of gaining access to additional employees or offer housing deals to get more graduates to move.

Concern about rising wages is somewhat misplaced, however: as a result of local wage inflation, some offshoring companies worry that Indian rates will soon reach US levels. Our projections show that average wages for young professionals in service jobs in India probably won't exceed 30 percent of US levels, because of competitive pressures: when average Indian wages reach that threshold, companies will try to employ graduates from countries with lower or comparable wages. Supply from these countries will satisfy all likely demand for the foreseeable future. We therefore do not think that average wages for graduates employed in any of the low-wage countries involved in offshoring, India included, will rise any higher than 30 percent of current wages for young professionals in the United States—about what young professionals in Mexico earn today.

[6] Diana Farrell, Martha A. Laboissière, and Jaeson Rosenfeld, "Sizing the emerging global labor market," *The McKinsey Quarterly*, 2005 Number 3, pp. 92–103 (www.mckinseyquarterly.com/links/18754).

Improve the infrastructure

Our interviews with the multinationals' senior managers show that they rank India's infrastructure as the country's most serious flaw. On a scale of 1 to 5 (good to bad), China rates 2.5 for its infrastructure; India and Russia, each at 3.3, jointly hold last place among the 16 countries we assessed. More direct flights now link Europe with India's offshoring centers, but their poor roads and rudimentary traffic management make local commuting arduous. In 2004 India spent $2 billion on its road network; China spent $30 billion.[7] And despite improvements, India's telecom network still suffers from quality issues.

To stay at the cutting edge of offshoring, India must invest a lot more in its infrastructure—and a lot faster. Government neglect of offshoring may arguably have been benign up to now, but continued neglect of the infrastructure would be a mistake. Only the state can mobilize funds for the airports, communications networks, and utilities that the whole economy requires for healthy future growth (see "Reforming India's financial system," in this issue).
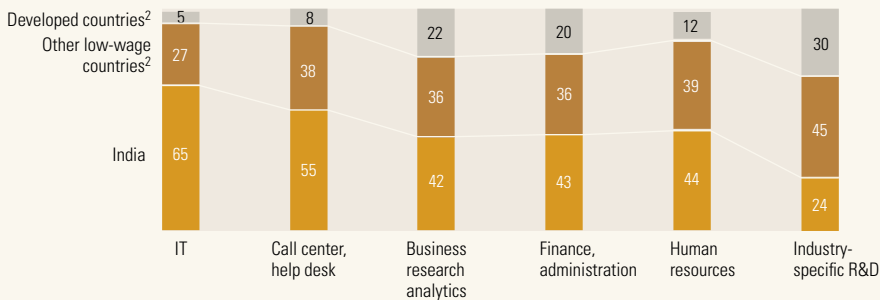
Move beyond IT and software

India's leaders should start trumpeting its advantages as an offshore location not only for IT but also for industrial R&D and medical research and for back-office functions. This year, the country recognized full product patents on pharmaceuticals. That should reassure international pharma companies,

EXHIBIT 3

Expanding beyond IT

Where does your company offshore or intend to offshore the following activities?
% respondents (n = 239)[1]

	IT	Call center, help desk	Business research analytics	Finance, administration	Human resources	Industry-specific R&D
Developed countries[2]	5	8	22	20	12	30
Other low-wage countries[2]	27	38	36	36	39	45
India	65	55	42	43	44	24

[1]Figures do not sum to 100%, because of rounding.
[2]Developed countries: Canada, United States, Western Europe; other low-wage countries: Africa, China, Eastern Europe and Russia (includes Turkey for business research analytics), Latin America, Malaysia, other Asia and Pacific.

Source: 2005 McKinsey offshoring survey of senior executives

[7]Edward Luce, "India to dip into forex reserves to build roads," *Financial Times*, October 16, 2004.

which had feared that any intellectual property they developed in India might not be protected sufficiently. In these new fields, where India offers the requisite talent but is far from having the dominance it enjoys in IT (Exhibit 3), it would do well to target global companies in the United Kingdom and the United States, which have so far been the pioneers in offshoring.

But in research, India faces stiff competition from China, Russia, and the United States, as R&D often gravitates to countries with large domestic markets for the resulting products. India enjoyed annual GDP growth of 6 percent from 2001 to 2004, for a total GDP of around $600 billion, but that isn't enough to offset China's advantage. India also suffers by comparison because of its income distribution. China's wealthy elite is small compared with its large, fast-growing middle class; India's elite is relatively larger, but in 2002 some 74 percent of the country's households earned less than $2,000,[8] which weakens the domestic market's overall purchasing power.

For back-office activities such as finance, HR, analytic and modeling services, and call centers, our projections indicate that India will have enough suitable labor to meet projected demand over the next five years. But the supply of suitable call-center employees will become tighter in some popular locations unless the hiring companies are encouraged to consider other cities. If companies go on crowding into the same few locations made popular by IT services, local wage inflation and high attrition rates will develop even in these new occupations. Policy makers really must try to disperse demand.

Thanks to the dynamism of India's IT services, the country is the world's preeminent offshoring destination. But other low-wage nations are now broadcasting their potential as offshore locations, and demand will quickly exceed India's supply of talent suitable for international companies. To stay on top, India must not only produce more top-quality engineers but also improve the suitability of other graduates. Finally, it has to show companies the depth and quality of its talent in areas other than IT—especially R&D and back-office work in industries such as finance and accounting. *Q*

[8]"The insidious charm of foreign investment," *Economist*, March 3, 2005.

Diana Farrell is director of the McKinsey Global Institute, **Noshir Kaka** is a principal in McKinsey's Mumbai office, and **Sascha Stürze** is a consultant in the Berlin office. Copyright © 2005 McKinsey & Company. All rights reserved.

E-mail this article to a colleague
www.mckinseyquarterly.com/links/18836