

Can Indian Software Firms Compete with the Global Giants?

Prabhudev Konana
University of Texas at Austin

The Indian IT services industry faces dramatic changes, challenges, and constraints as it uses the global delivery model to transform itself into a knowledge leader competing with established global giants.

Even though the entire Indian IT services industry represents less than a quarter of IBM Global Services, it is having a dramatic impact on the global consulting services industry. Giants like IBM, Accenture, Electronic Data Systems, and Deloitte are expanding rapidly in India to benefit from the low-cost, high-quality workforce, while Indian software firms are expanding in the US to create the closer customer relationships required to compete in providing high-end consulting services. This cross-movement of jobs and labor will create an interesting competitive dynamic as the cost structure converges and firms compete to provide knowledge leadership—concept, technology, and process innovation.

To become recognized global brands and move up the value chain, Indian software firms must promote knowledge leadership, create incentives to innovate, and foster efforts to enhance cultural alignment.

GLOBAL DELIVERY MODEL

The Indian IT services industry continues to make inroads into the global marketplace with its global delivery model (GDM), which uses a mix of onshore and offshore development. In 2005, the big three Indian IT services firms—Infosys, Tata Consultancy Services (TCS), and Wipro—surpassed \$2 billion in revenue and reported an astounding compound annual growth rate of more than 30 percent (www.infosys.com/investor/default.asp; www.tcs.com/investors/default.aspx; www.wipro.com/itservices/index.htm).

The GDM leverages the low-cost, educated workforce of India and other emerging economies to provide quality, cost-effective services to the developed world. GDM's impact on the global IT services industry is profound and irreversible.

Two-way job movement

Due to dramatic cost advantages overseas, the GDM puts significant economic pressure on US firms to adopt a competitive offshore-onshore development strategy. Major IT services companies such as IBM Global Services, Accenture, Ernst & Young, Deloitte, and Electronic Data Systems are aggressively expanding in India to benefit from the GDM.

A competitive response leads to a bandwagon effect. When one major firm sets up an offshore subsidiary to generate a competitive advantage, others will follow quickly. Thus, US firms are currently hiring a staggering number of Indian software professionals.

However, the movement of labor and work is not just unidirectional. While Indian IT executives often talk about moving up the value chain, their firms are unlikely to capture large projects—more than \$100 million—or mega contracts—more than \$1 billion—without an extensive onshore presence.

Cultural alignment and closer customer relationships are key to competing successfully in providing high-end consulting services. Further, the perennial uncertainty of obtaining US work visas creates project planning and management risks. Recognizing these difficulties,

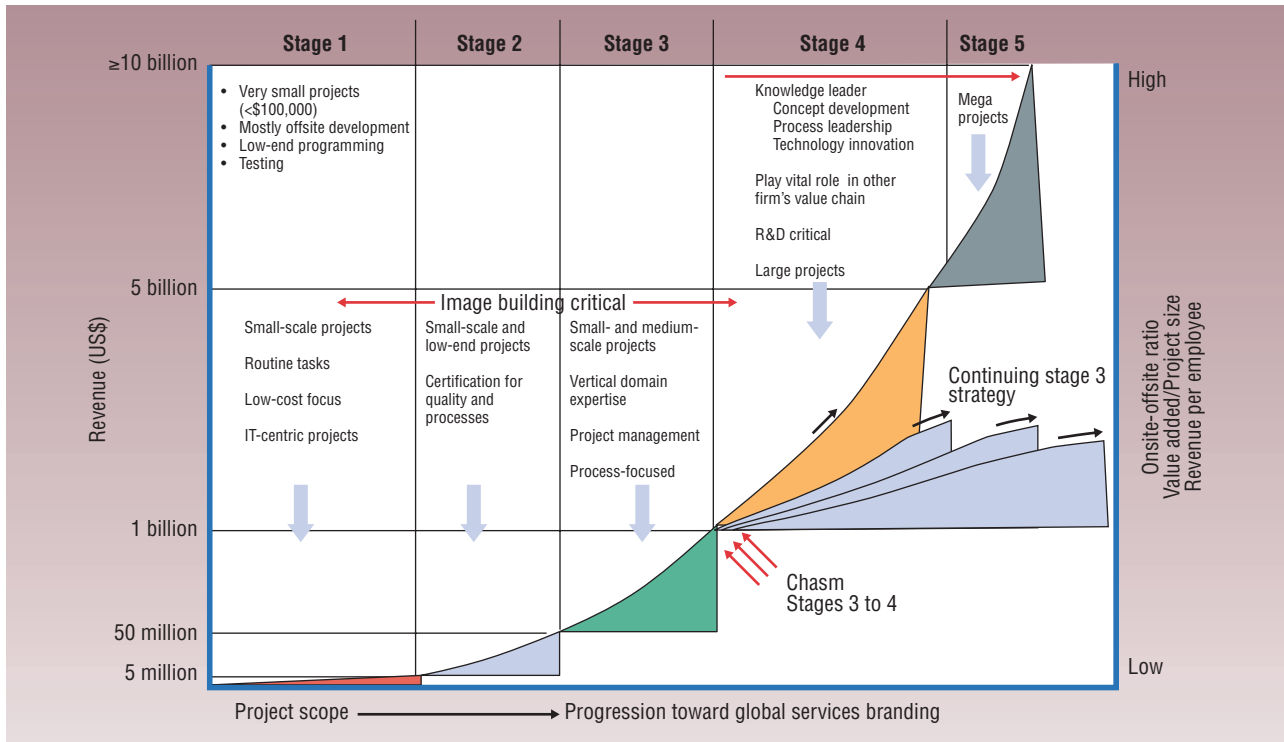


Figure 1. IT services firms' growth trajectory. Most Indian IT firms have closely followed the first three stages.

Infosys, TCS, and Wipro recently acquired consulting firms and hired hundreds of software professionals from within the US.

Cost structure

The two-way movement of jobs and labor creates interesting implications for the future. As Indian firms expand in the US, their cost structure is certain to increase. In contrast, as US firms expand in India and other developing economies, their cost structure is likely to decrease.

Since US firms often hire managers and software professionals who have experience working at established Indian firms, the labor cost for Indian firms is expected to increase as they compete to retain talent. Unless the Indian educational system can produce a large number of high-quality new graduates to meet the demand for IT workers, there will be a gradual movement of work to other emerging countries.

Such adjustments are already taking place as Indian IT services firms have begun establishing subsidiaries in China. Offshoring and outsourcing to low-wage countries such as China and the Philippines is obviously a further consideration for US firms. IBM is already expanding aggressively into China by opening a new development center in Dalian.¹

Thus, the ratio of offshore-onshore development and the extent of each country's presence in the other will adjust according to labor coordination costs and risks. Coordination costs will decline as both providers and customers learn to work within the GDM. In contrast,

labor costs and risks, to some extent, will increase. When an equilibrium in the cost structure eventually occurs, the remaining question will be whether Indian companies can develop the characteristics required to compete in the global marketplace and capture large and mega contracts.

INDIAN IT GROWTH STAGES

For some Indian IT firms, moving up the value chain means providing end-to-end enterprise or vertical solutions for the retail, energy, government, and manufacturing sectors.

Figure 1 depicts a different point of view, outlining five stages in the growth trajectory required for Indian IT firms to compete effectively. Thus far, the industry has closely followed the first three stages of this trajectory.

- **Stage 1:** Firms rely on very small projects, of less than \$100,000, focusing on IT-centric, low-cost routine tasks such as testing or low-end programming, which are mostly performed offshore. All Indian IT firms began at this stage.
- **Stage 2:** The focus is on small-scale and low-end medium-size projects of up to \$1 million. The firms continue to provide low-cost service, but with greater emphasis on quality and reliability. The projects involve some onsite development, which typically constitutes less than 20 percent of the total project cost. Firms establish their software development capabilities and quality-enhancing processes through cer-

tifications such as the Capability Maturity Model (CMM) and high-quality infrastructure.

- **Stage 3:** Firms develop capabilities for providing a wide range of products and services such as vertical solutions. They develop a reputation for successfully managing small- and medium-size projects in the \$1 million to \$50 million range using the GDM. These firms establish a minor onshore presence through subsidiaries while demonstrating their ability to provide high-end business consulting.
- **Stage 4:** Firms set up onshore subsidiaries for consulting and software services and export the model to other developing countries to leverage wage differentials. The percentage of non-Indian employees continues to increase. At this stage, firms are more likely to capture high-end medium-size (\$50 million to \$100 million) and large-scale (\$100 million to \$1 billion) projects. They begin to play a vital role in major companies' value chain and establish lock-in and economies of scale. They focus increasingly on R&D for next-generation technologies and business practices, and they play an important role as major trendsetters and knowledge leaders.
- **Stage 5:** Firms rapidly expand globally with country-specific cultural alignment and adjustments. Extending the knowledge frontiers through cutting-edge research and technologies, they are capable of winning and successfully managing multibillion-dollar contracts using an onshore-offshore business model.

The big three Indian IT services firms are currently transitioning from stage 3 to 4. However, the transition might not be smooth and they are likely to encounter many hurdles. While these firms can continue to grow at 30 percent or more with numerous small- and medium-size low-end projects, scalability and management will become increasingly challenging. To successfully move to stages 4 and 5, firms must position themselves as knowledge leaders.

KNOWLEDGE LEADERSHIP

The key to continued growth for Indian firms relies on their ability to project themselves as knowledge leaders. In association with IT services, knowledge leadership spans three somewhat overlapping categories: technology innovations, concept development, and process leadership.

Technology leadership

Indian IT firms have established a high standard in software development, but now they must gain credi-

bility by innovating next-generation tools, languages, technology concepts, and standards. Previously, Indian IT firms successfully introduced a few domain-specific packages on platforms built by others. Now, they should develop the ability to influence industry standards, propose architectural frameworks, and promote concepts such as component technology. Developing such capabilities requires a culture of innovation and a system that offers incentives to reward success. However, rigid processes such as CMM certification that have helped these firms to become known for quality might not necessarily encourage innovation. In fact, rigidity can stifle unconventional practices even when they might have a positive influence on innovation.

Forming proactive partnerships with universities in both curriculum development and basic and applied research could benefit Indian IT firms. Most such companies have been successful in providing software and packaged curriculum to train students in using specific tools.

Although such training may have short-term benefits, it does not prepare future professionals to become knowledge leaders. Thus, Indian firms must focus on the next step in developing human resources through greater involvement with local universities in research and technology creation.

Concept leadership

Large US-based consulting firms often strive to showcase their leadership through cutting-edge business and technology concepts such as client-server computing, electronic commerce, collaborative computing, knowledge management, grid computing, or peer-to-peer computing.

One example is IBM's OnDemand business environment, which addresses business problems that persist despite numerous technological innovations. Although the on-demand concept is not new, IBM has successfully positioned itself as a leader in using technology to solve business problems and as having the capability to provide end-to-end services for dynamic business endeavors.

While Indian software firms have mastered the onshore-offshore development model, US firms are attempting to catch up by hiring software professionals from large Indian IT firms. It is very likely that in a few years, the productivity and quality of services for both US and Indian firms in a GDM will converge.

Process leadership

US firms have a long tradition of pushing process innovation. The intense competitive environment and the demand for higher productivity have forced firms to develop innovative processes that provide a competitive advantage, at least for the short term. Process innovation

The key to continued growth for Indian firms relies on their ability to project themselves as knowledge leaders.

often results from observing inefficiencies or adopting emerging technologies developed at universities and in research laboratories.

One such process innovation is using radio frequency identification tags in the supply chain. Companies can use technologies such as RFID to create new business processes that have a profound impact on the bottom line in a highly competitive, low-margin, retail business.

High-end consulting firms must articulate emerging processes and help implement innovations. An example of this is Cemex's use of wireless and handheld devices for dynamic synchronization of operations to provide mixed concrete within 20 minutes' time rather than the prevalent three-hour timeframe.

Although they will encounter both internal challenges and external constraints during the process, Indian firms must acquire these knowledge leadership capabilities if they are to compete successfully for large and mega projects.

Indian firms will likely face challenges as they endeavor to retain talent and ideas.

CHANGES, CHALLENGES, AND CONSTRAINTS

The internal challenges that Indian firms must face include the need to expand their presence in developed and other countries by hiring local talent and collaborating with universities.

Innovation in providing software services often comes from observing existing business practices and identifying the problems that potential customers face. While Indian firms have benefited from attracting former residents who have returned from the US with a wealth of knowledge and experience in business practices, they now need to seek culture-specific talents such as familiarity with work culture, laws, social norms, and government bureaucracy.

Intellectual collaboration

Even though they might not be beneficial until decades later, IT firms need to create and support long-term collaborative research efforts with universities and research labs. IBM, for example, has supported university research that did not produce immediate benefits, but the efforts attracted outstanding faculty to share their latest research findings and collaborate with universities on next-generation technologies such as copper chips, nanotechnology, and bioinformatics.

While forward-looking Indian IT firms such as TCS and Infosys have affiliations with MIT and the Wharton School of the University of Pennsylvania, respectively, firms generally are not accustomed to the culture of research collaborations. University relationships have been limited to building brand recognition and confined to case studies, rather than developing knowledge leadership. Collaboration with Indian universities appears

to be limited to writing case studies or training students by providing software and packaged curriculum for specific projects that might serve the company on a short-term basis, but does not prepare future professionals to become knowledge leaders.

Indian firms must be proactive to partner with universities not only in IT curriculum but also in basic and applied research. They must focus on the next step to develop their staffing resources through increased involvement with local universities in research and technology creation.

Transformative training

Internal training for professionals must expand beyond IT-centric or project management skills that firms such as Trilogy Software have championed. Transforming an organizational culture requires an entrepreneurial environment that promotes the creation of new technologies, concepts, and processes. Further, software professionals who interface

with customers must speak the business and customer language.

Management must alter incentives and organizational processes to foster innovative thinking, which is inhibited by cultural traits such as obedience, subservience, or nepotism—affecting organizational performance and dynamics. Indian firms must challenge established practices and support their workers in pursuing unconventional thinking that encourages innovation.

Most Indian IT firms face significant challenges in retaining talent in an expanding market with increased competition from global competitors. Indian IT software executives acknowledge that they have a difficult time recruiting skilled workers, and they find it even more challenging to retain their trained staff. Narayan Murthy, the cofounder of Infosys, recently suggested that 75 percent of engineering graduates are not employable (www.thehindu.com/2006/01/04/stories/2006010407060400.htm). Early evidence also suggests that some experienced software professionals are leaving large Indian software firms to launch their own startups, akin to their counterparts in the US. For example, after IBM acquired Tivoli Systems, its founders and more-experienced employees went on to create numerous other startups. Indian firms will likely face challenges as they endeavor to retain talent and ideas.

Infrastructure impediments

In addition to the need to develop an employable workforce, the Indian IT industry must contend with significant infrastructure limitations as well as complex political and socioeconomic factors that have a significant impact on the domestic business environment.^{1,2}

In response to infrastructural challenges, IT firms have explored options such as airlifting foreign clients from airports to work in their facilities and building five-star hotels on their premises. However, these efforts are unsustainable. The infrastructure in major IT hubs like Bangalore has nearly collapsed,² leading to huge productivity losses. Most IT professionals spend three to five hours commuting to work every day. Further, an issue that has attracted little attention is the need for coordination with workers in developed countries, which often leads to long working hours that will eventually result in burnout and productivity losses.

While IT firms have taken a keen interest in influencing Indian federal and state governments to improve the infrastructure, the results have been mixed. However, awareness of the existing problems and the need to develop and improve the infrastructure beyond a few IT hubs is growing.

Despite the large number of English-speaking engineering graduates, Indian firms have faced excessive employee turnover (www.deccanherald.com/deccanherald/feb112006/update943272006211.asp). Indian software executives acknowledge that firms have a difficult time identifying and recruiting talent, and they find it even more challenging to retain workers once they have been trained.

Leading Indian software firms have taken significant steps to become truly global. They have begun to acquire US consulting and technology firms, and they have hired experienced consultants to help develop an onshore presence and improve business consulting capabilities. These initiatives are a radical shift in Indian firms' corporate strategy and culture. There is increasing awareness of the need to develop a global workforce and to achieve cultural alignment without focusing excessively on Indian software prowess. Infosys, for example, has established InStep, an internship program that recruits employees from more than 30 countries, including the US (www.infosys.com/media/press_releases/instep_induction.asp).

Challenges still exist for Indian firms to project themselves as knowledge leaders. Only a few have actively partnered with universities or have R&D capabilities to create technology, concept, and process leadership. Knowledge leadership will still be elusive in the near future, but without it, current global giants will continue to provide high-margin, cutting-edge solutions. However, Indian IT companies will continue to impose pricing pressure on established, global companies for other types of IT solutions until the cost structures converge. Although leading Indian firms are likely to compete as knowledge leaders globally in the future, a vast majority will continue to struggle. Many small and medium-size Indian IT firms will have difficulty coping with hiring and retaining talent and cost appreciation.

Firms that cannot transition quickly could become targets for acquisition by US firms. ■

References

1. M.S. Ahluwalia, "Economic Reforms in India Since 1991: Has Gradualism Worked?" *J. Economic Perspective*, vol. 16, no. 3, 2002, pp. 67-88.
2. India Economic Summit Report, "Making Incredible India Competitive," Nov. 2005; www.weforum.org/site/homepublic.nsf/Content/Report+India+2005+-+cover.

Prabhudev Konana is a Distinguished Teaching Professor and an associate professor of management information systems at the McCombs School of Business at the University of Texas at Austin. He is also a faculty member of the South Asia Institute and assistant director at the Center for Research in Electronic Commerce. His research interests include outsourcing and offshoring decision variables, IT business value for developing economies, and online supply chain management. Konana received a PhD in management information systems from the University of Arizona. Contact him at pkonana@mail.utexas.edu.



The magazine
that helps scientists
and engineers
to apply high-end
software in
their research!

\$42
print

Save 42% off the non-member price!

2006	<p>Jan/Feb Special-Purpose Computing</p> <p>Mar/Apr Monte Carlo Methods</p> <p>May/Jun Noise and Signal Interaction</p> <p>Jul/Aug Pulling It All Together</p> <p>Sep/Oct Physics Curriculum</p> <p>Nov/Dec Multigrid Computing and Finite Element Methods</p>	 
-------------	--	--

Subscribe to CISE online at <http://cise.aip.org>
and www.computer.org/cise