THE RISE OF INDIA
And what it means for America
BY MANJEET KRIPALANI AND PETE ENGARDIO (P. 66)

GE’s Anandraj Sengupta, engineer at the John F. Welch Technology Center, Bangalore
Pulling into General Electric’s John F. Welch Technology Center, a uniformed guard waves you through an iron gate. Once inside, you leave the dusty, traffic-clogged streets of Bangalore and enter a leafy campus of low buildings that gleam in the sun. Bright hallways lined with plants and abstract art—“it encourages creativity,” explains a manager—lead through laboratories where physicists, chemists, metallurgists, and computer engineers huddle over gurgling beakers, electron microscopes, and spectrophotometers. Except for the female engineers wearing saris and the soothing Hindi pop music wafting through the open-air dining pavilion, this could be GE’s giant research-and-development facility in the upstate New York town of Niskayuna.

It’s more like Niskayuna than you might think. The center’s 1,800 engineers—a quarter of them have PhDs—are engaged in fundamental research for most of GE’s 13 divisions. In one lab, they tweak the aerodynamic designs of turbine-engine blades. In another, they’re scrutinizing the molecular structure of materials to be used in DVDs for short-term use in which the movie is automatically erased after a few days. In another, technicians have rigged up a working model of a GE plastics plant in Spain and devised a way to boost output there by 20%. Patents? Engineers here have filed for 95 in the U.S. since the center opened in 2000.

Pretty impressive for a place that just four years ago was a fallow plot of land. Even more impressive, the Bangalore operation has become vital to the future of one of America’s biggest, most profitable companies. “The game here really isn’t about saving costs but to speed innovation and gener-
“Just like China drove down costs in manufacturing and Wal-Mart in retail, India will drive down costs in services,” says an Indian IT exec.

“India has always had brilliant, educated people,” says tech-trend forecaster Paul Saffo of the Institute for the Future in Menlo Park, Calif. “Now Indians are taking the lead in colonizing cyberspace.”

This techno take-off is wonderful for India—but terrifying for many Americans. In fact, India’s emergence is fast turning into the latest Rorschach test on globalization. Many see India’s digital workers as bearers of new prosperity to a deserving nation and vital partners of Corporate America. Others see them as shock troops in the final assault on good-paying jobs. Howard Rubin, executive vice-president of Meta Group Inc., a Stamford (Conn.) information-technology consultant, notes that big U.S. companies are shedding 500 to 2,000 IT staffers at a time. “These people won’t get reabsorbed into the workforce until they get the right skills,” he says. Even Indian execs see the problem. “What happened in manufacturing is happening in services,” says Azim

WHERE INDIA IS MAKING AN IMPACT

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<th>SOFTWARE</th>
<th>IT CONSULTING</th>
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<td>India is now a major base for developing new applications for finance, digital appliances, and industrial plants.</td>
<td>Companies such as Wipro, Infosys, and Tata are managing U.S. IT networks and re-engineering business processes.</td>
<td>Thousands of Indians handle customer service and process insurance claims, loans, bookings, and credit-card bills.</td>
<td>Intel, Texas Instruments, and many U.S. startups use India as an R&amp;D hub for microprocessors and multimedia chips.</td>
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H. Premji, chairman of IT supplier Wipro Ltd. “That raises a lot of social issues for the U.S.”

No wonder India is at the center of a brewing storm in America, where politicians are starting to view offshore outsourcing as the root of the jobless recovery in tech and services. An outcry in Indiana recently prompted the state to cancel a $15 million IT contract with India’s Tata Consulting. The telecom workers’ union is up in arms, and Congress is probing whether the security of financial and medical records is at risk. As hiring explodes in India, the jobless rate among U.S. software engineers has more than doubled, to 4.6%, in three years. The rate is 5.7% for electrical engineers and 7.7% for network administrators. In all, the Bureau of Labor Statistics reports that 234,000 IT professionals are unemployed.

The biggest cause of job losses, of course, has been the U.S. economic downturn. Still, there’s little denying that the offshore shift is a factor. By some estimates, there are more IT engineers in Bangalore (150,000) than in Silicon Valley (120,000). Meta figures at least one-third of new IT development work for big U.S. companies is done overseas, with India the biggest site. And India could start grabbing jobs from other sectors. A.T. Kearney Inc. predicts that 500,000 financial-services jobs will go offshore by 2008. Indiana notwithstanding, U.S. governments are increasingly using India to manage everything from accounting to their food-stamp programs. Even the U.S. Postal Service is taking work there. Auto engineering and drug research could be next.

More Science in Schools

TECH LUMINARY Andrew S. Grove, CEO of Intel Corp., warns that “it’s a very valid question” to ask whether America could eventually lose its overwhelming dominance in IT, just as it did in electronics manufacturing. Plunging global telecom costs, lower engineering wages abroad, and new interactive-design software are driving revolutionary change, Grove said at a software conference in October. “From a technical and productivity standpoint, the engineer sitting 6,000 miles away might as well be in the next cubicle and on the local area network.” To maintain America’s edge, he said, Washington and U.S. industry must double software productivity through more R&D investment and science education.

But there’s also a far more positive view—that harnessing Indian brainpower will greatly boost American tech and services leadership by filling a big projected shortfall in skilled labor as baby boomers retire. That’s especially possible with smarter U.S. policy (page 76). Companies from GE Medical Systems to Cummins to Microsoft to enterprise-software firm PeopleSoft that are hiring in India say they aren’t laying off any U.S. engineers. Instead, by augmenting their U.S. R&D teams with the 260,000 engineers pumped out by Indian schools each year, they can afford to throw many more brains at a task and speed up product launches, develop more prototypes, and upgrade quality. A top electrical or chemical engineering grad from India’s Institutes of Technology (IITs) earns about $10,000 a year—roughly one-eighth of U.S. starting pay. Says Rajat Gupta, an IIT-Delhi grad and senior partner at consulting firm McKinsey & Co.: “Offshoring work will spur innovation, job creation, and dramatic increases in productivity that will be passed on to the consumer.”

Whether you regard the trend as disruptive or beneficial, one thing is clear. Corporate America no longer feels it can afford to ignore India. “There’s just no place left to squeeze” costs in the U.S., says Chris Disher, a Booz Allen Hamilton Inc. outsourcing specialist. “That’s why every CEO is looking at India, and every board is asking about it.” neoIT, a consultant advising U.S. clients on how to set up shop in India, says it has been deluged by big companies that have been slow to move offshore. “It is getting to a state where companies are literally desperate,” says Bangalore-based neoIT managing partner Avinash Vashistha.

As a result of this shift, few aspects of U.S. business remain untouched. The hidden hands of skilled Indians are present in the interactive Web sites of companies such as Lehman Brothers and Boeing, display ads in your Yellow Pages, and the electronic circuitry powering your Apple Computer iPod. While Wall Street sleeps, Indian analysts digest the latest financial dis-
WHO'S BULKING UP
Some of the biggest U.S. players in India

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<th>COMPANY</th>
<th>PURPOSE</th>
<th>INDIA STAFF</th>
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<tr>
<td>GE Capital Services</td>
<td>Back-office work</td>
<td>16,000</td>
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<tr>
<td>GE’s John Welch Tech Center</td>
<td>Product R&amp;D</td>
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<td>IBM Global Services</td>
<td>IT services, software</td>
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<td>Oracle</td>
<td>Software, services</td>
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<td>EDS</td>
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<td>Intel</td>
<td>Chip design, software</td>
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<td>J.P. Morgan Chase</td>
<td>Back-office, analysis</td>
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*By 2005  **Unspecified  †By 2004

Source: Company reports, Nasscom, Evalueserve

sleeping on bare pavement. More than a third of India’s 1 billion citizens are illiterate, and just 60% of homes have electricity. Most bureaucracies are bloated, corrupt, and dysfunctional. The government’s 10% budget deficit is alarming. Tensions between Hindus and Muslims always seem poised to explode, and the risk of war with nuclear-armed Pakistan is ever-present.

So it’s little wonder that, compared to China with its modern infrastructure and disciplined workforce, India is far behind in exports and as a magnet for foreign investment. While China began reforming in 1979, India only started to emerge from self-imposed economic isolation after a harrowing financial crisis in 1991. China has seen annual growth often exceeding 10%, far better than India’s decade-long average of 6%.

In the Valley’s Marrow

STILL, THIS DEEP SOURCE of low-cost, high-IQ, English-speaking brainpower may soon have a more far-reaching impact on the U.S. than China. Manufacturing—China’s strength—accounts for just 14% of U.S. output and 11% of jobs. India’s forte is services—which make up 60% of the U.S. economy and employ two-thirds of its workers. And Indian knowledge workers are making their way up the New Economy food chain, mastering tasks requiring analysis, marketing acumen, and creativity.

This means India is penetrating America’s economic core. The 900 engineers at Texas Instruments Inc.’s Bangalore chip-design operation boast 225 patents. Intel Inc.’s Bangalore campus is leading worldwide research for the company’s 32-bit microprocessors for servers and wireless chips. “These are corporate crown jewels,” says Intel India President Ketan Sampat. India is even getting hard-wired into Silicon Valley. Venture capitalists say anywhere from one-third to three-quarters of the software, chip, and e-commerce startups they now back have Indian R&D teams from the get-go. “We can barely imagine investing in a company without at least asking what their plans are for India,” says Sequoia Capital partner Michael Moritz, who nurtured Google, Flextronics, and Agile Software. “India has seeped into the marrow of the Valley [page 74].”

It’s seeping into the marrow of Main Street. This year, the tax returns of some 20,000 Americans were prepared by $500-a-month CPAs such as Sandhya Iyer, 24, in the Bombay office of Bangalore’s Mphasis. After reading scanned seed and fertilizer invoices, soybean sales receipts, W2 forms, and investment records from a farmer in Kansas, Iyer fills in the farmer’s 82-page return. “He needs to amortize these,” she types next to an entry for new machinery and a barn. A U.S. CPA reviews and signs the finished return. Next year, up to 200,000 U.S. returns will be done in India, says

A top electrical-engineering grad from one of the six Indian Institutes of Technology fetches about $10,000 a year

...
CCH Inc. in Riverwoods, Ill., a supplier of accounting software. And it’s not only Big Four firms that are outsourcing. “We are seeing lots of firms with 30 to 200 CPAs—even single practitioners,” says CCH Sales Vice-President Mike Sabbatis.

The gains in efficiency could be tremendous. Indeed, India is accelerating a sweeping reengineering of Corporate America. Companies are shifting bill payment, human resources, and other functions to new, paperless centers in India. To be sure, many corporations have run into myriad headaches, ranging from poor communications to inconsistent quality. Dell Inc. recently said it is moving computer support for corporate clients back to the U.S. Still, a raft of studies by Deloitte Research, Gartner, Booz Allen, and other consultants find that companies shifting work to India have cut costs by 40% to 60%. Companies can offer customer support and use pricey computer gear 24/7. U.S. banks can process mortgage applications in three hours rather than three days. Predicts Nandan M. Nilekani, managing director of Bangalore-based Infosys Technologies Ltd.: “Just like China drove down costs in manufacturing and Wal-Mart in retail,” he says, “India will drive down costs in services.”

But deflation will also mean plenty of short-term pain for U.S. companies and workers who never imagined they’d face foreign rivals. Consider America’s $240 billion IT-services industry. Indian players led by Infosys, Tata, and Wipro got their big breaks during the Y2K scare, when U.S. outfits needed all the software help they could get. Indians still have less than 3% of the market. But by undercutting giants such as Accenture, IBM, and Electronic Data Systems by a third or more for software and consulting, they’ve altered the industry’s pricing. “The Indian labor card is unbeatable,” says Chief Technology Officer John Parkinson of consultant Cap Gemini Ernst & Young. “We don’t know how to use technology to make up the difference.”

Wrenching Change

Many U.S. white-collar workers are also in for wrenching change. A study by McKinsey Global Institute, which believes offshore outsourcing is good, also notes that only 36% of Americans displaced in the previous two decades found jobs at the same or higher pay. The incomes of a quarter of them dropped 30% or more. Given the higher demands of employers, who want technicians adept at innovation and management, it could take years before today’s IT workers land solidly on their feet.

India’s IT workers, in contrast, sense an enormous opportunity. The country has long possessed some basics of a strong market-driven economy: private corporations, democratic government, Western accounting standards, an active stock market, widespread English use, and schools strong in computer science and math. But its bureaucracy suffocated industry with onerous controls and taxes, and the best scientific and business minds went to the U.S., where the 1.8 million Indian expatriates rank among the most successful immigrant groups.

Now, many talented Indians feel a sense of optimism India hasn’t experienced in decades. “IT is driving India’s boom, and we in the younger generation can really deliver the country from poverty,” says Rhythm Tyagi, 22, a master’s degree student at the new Indian Institute of Information Technology in Bangalore. The campus is completely wired for Wi-Fi and boasts classrooms with videoconferencing to beam sessions to 300 other colleges.

That confidence is finally spurring the government to tackle many of the problems that have plagued India for so long. Since 2001, Delhi has been furiously building a network of high-
ways. Modern airports are next. Deregulation of the power sector should lead to new capacity. Free education for girls to age 14 is a national priority. “One by one, the government is solving the bottlenecks,” says Deepak Parekh, a financier who heads the quasi-governmental Infrastructure Development Finance Co.

Future Vision

India also is working to assure that it will be able to meet future demand for knowledge workers at home and abroad. India produces 3.1 million college graduates a year, but that’s expected to double by 2010. The number of engineering colleges is slated to grow 50%, to nearly 1,600, in four years. Of course, not all are good enough to produce the world-class grads of elite schools like the IITs, which accepted just 3,500 of 178,000 applicants last year. So there’s a growing movement to boost faculty salaries and reach more students nationwide through broadcasts. India’s rich diaspora population is chipping in, too. Prominent Indian Americans helped found the new Indian School of Business, a tie-up with Wharton School and Northwestern University’s Kellogg Graduate School of Management that lured most of its faculty from the U.S. Meanwhile, the six IIT campuses are tapping alumni for donations and research links with Stanford, Purdue, and other top science universities.

“Our mission is to become one of the leading science institutions in the world,” says director Ashok Mishra of IIT-Bombay, which has raised $16 million from alumni in the past five years.

If India manages growth well, its huge population could prove an asset. By 2020, 47% of Indians will be between 15 and 59, compared with 35% now. The working-age populations of the U.S. and China are projected to shrink. So India is destined to have the world’s largest population of workers and consumers. That’s a big reason why Goldman, Sachs & Co. thinks India will be able to sustain 7.5% annual growth after 2005.

Skeptics fear U.S. companies are going too far, too fast in linking up with this giant. But having watched the success of the likes of GE Capital International Services, many execs feel they have no choice. Inside GEICS’ Bangalore center—one of four in India—Gauri Puri, a 28-year-old dentist, is studying an insurance claim for a root-canal operation to see if it’s covered in a certain U.S. patient’s dental plan. Two floors above, members of a 550-strong analytics team are immersed in spreadsheets filled with a boggling array of data as they devise statistical models to help GE sales staff understand the needs, strengths, and weaknesses of customers and rivals. Other staff prepare data for GE annual reports, write enterprise resource-planning software, and process $35 billion worth of...
global invoices. Says GE Capital India President Pramod Bhasin: “We are mission-critical to GE.” The 700 business processes done in India save the company $340 million a year, he says.

Indian finance whizzes are a godsend to Wall Street, too, where brokerages are under pressure to produce more independent research. Many are turning to outfits such as OfficeTiger in the southern city of Madras. The company employs 1,200 people who write research reports and do financial analysis for eight Wall Street firms. Morgan Stanley, J.P. Morgan, Goldman Sachs, and other big investment banks are hiring their own armies of analysts and back-office staff. Many are piling into Mindspace, a sparkling new 140-acre city-within-a-city abutting Bombay’s urban squalor. Some 3 million square feet are already leased to Western finance firms. By yearend, Morgan Stanley will fill several floors of a new building.

For Silicon Valley startups, Indian engineers let them stretch their R&D budgets and do so with a fraction of the cost in the U.S., have been the key to the company’s survival, says Chief Executive Munjal Shah, who grew up in the Valley. Andale’s 155 workers in India, where employing a top software programmer runs a small fraction of the cost in the U.S., have been the key to the company’s survival, says Chief Executive Munjal Shah, who grew up in the Valley. Andale’s 155 workers in India, where employing a top software programmer runs a small fraction of the cost in the U.S., have been the key to the company’s survival, says Chief Executive Munjal Shah, who grew up in the Valley.

The chief architects of this rising business model are the 30,000-odd Indian IT professionals who live and work in the Valley. Indian engineers have become fixtures in the labs of America’s top chip and software companies. Indian émigrés have also excelled as managers, entrepreneurs, and venture capitalists. As of 2000, Indians were among the founders or top execs of at least 972 companies, says AnnaLee Saxenian, who studies immigrant business networks at the University of California at Berkeley.

Until recently, that brainpower mostly went in one direction, benefiting the Valley more than India. Now, this ambitious diaspora is generating a flurry of chip, software, and e-commerce startups in both nations, mobilizing billions in venture capital. The economics are so compelling that some venture capitalists demand Indian R&D be included in business plans from Day One. Says Robin Vasan, a partner at Mayfield in Menlo Park: “This is the way they need to do business.”

The phenomenon is due in no small part to the professional and social networks Indians have set up in the Valley, such as The Indus Entrepreneurs (TIE), in Santa Clara: It now has 42 chapters in nine countries. Prominent Indians such as TIE founder and serial entrepreneur Kanwal Rekhi, venture capitalist Vinod Khosla, entrepreneur Kanwal Rekhi, and former Intel Corp. executive Vin Dham serve as startup mentors and angel investors. In early November, Bombay-born Ash Lilani, senior vice-president at Silicon Valley Bank, led 20 Valley VC’s on their first trip to India to scout opportunities. Of the bank’s 5,000 Valley clients, 10% have some development work in India, but that’s expected to rise to 25% in two years. Such opportunities for the Valley’s Indians flow both ways. Hundreds have returned to India since 2000 to start businesses or help expand R&D labs for the likes of Oracle, Cisco, Systems, and Intel. The downturn—and Washington’s decision to issue fewer temporary work visas—accelerated the trend. At a Nov. 6 tech job fair in Santa Clara, hundreds of engineers lined up, résumés in hand, for Indian openings offered by companies from Microsoft Corp. to Juniper Networks Inc.

“The real development and design jobs are in India,” says Indian-born job-seeker Jay Venkat, 24, a University of Alabama electrical engineering grad.

The deeper, more symbiotic relationship developing between the Valley and India goes far beyond the “body shopping” of the 1990s, when U.S. companies mainly wanted low-wage software-code writers. Now the brain drain from India is turning into what Saxenian calls “brain circulation,” nourishing the tech scenes in both nations.

Some Valley companies even credit India with saving them from oblivion. Web-hosting software outfit Ensim Corp. in Sunnyvale relied on its 100-engineer team in Bangalore to keep designing lower-cost new products right through the downturn. “This company would not survive a day if not for the operation in India,” says CEO Kanwal Rekhi. Before long, India may prove as crucial to the Valley’s success as silicon itself.

By Robert D. Hof in Santa Clara, Calif., with Manjeet Khipalani in Bombay
COVER STORY

INDIA

R&D budgets. PortalPlayer Inc., a Santa Clara (Calif.) maker of multimedia chips and embedded software for portable devices such as music players, has hired 100 engineers in India and the U.S. who update each other daily at 9 a.m. and 10 p.m. J.A. Chowdary, CEO of PortalPlayer’s Hyderabad subsidiary Pixe; says the company has shaved up to six months off the development cycle—and cut R&D costs by 40%. Impressed, venture capitalists have pumped $82 million into PortalPlayer.

More Bang for the Buck

OLD ECONOMY COMPANIES are benefiting, too. Engine maker Cummins plans to use its new R&D center in Pune to develop the sophisticated computer models needed to design upgrades and prototypes electronically. Says International Vice-President Steven M. Chapman: “We’ll be able to introduce five or six new engines a year instead of two” on the same $250 million R&D budget—without a single U.S. layoff.

The nagging fear in the U.S., though, is that such assurances will ring hollow over time. In other industries, the shift of low-cost production work to East Asia was followed by engineering. Now, South Korea and Taiwan are global leaders in notebook PCs, wireless phones, memory chips, and digital displays. As companies rely more on IT engineers in India and elsewhere, the argument goes, the U.S. could cede control of other core technologies. “If we continue to offshore high-skilled professional jobs, the U.S. risks surrendering its leading role in innovation,” warns John W. Steadman, incoming U.S. president of Institute of Electrical & Electronics Engineers Inc. That could also happen if many foreigners—who account for 60% of U.S. science grads and who have been key to U.S. tech success—no longer go to America to launch their best ideas.

Throughout U.S. history, workers have been pushed off farms, textile mills, and steel plants. In the end, the workforce has managed to move up to better-paying, higher-quality jobs. That could well happen again. There will still be a crying need for U.S. engineers, for example. But what’s called for are engineers who can work closely with customers, manage research teams, and creatively improve business processes. Displaced technicians who lack such skills will need retraining; those entering school will need broader educations.

Adapting to the India effect will be traumatic, but there’s no sign Corporate America is turning back. Yet the India challenge also presents an enormous opportunity for the U.S. If America can handle the transition right, the end result could be a brain gain that accelerates productivity and innovation. India and the U.S., nations that barely interacted 15 years ago, could turn out to be the ideal economic partners for the new century.

—With Steve Hamm in New York

COMMENTARY

BY MICHAEL J. MANDEL

Meeting the Asian Challenge

How America can boost innovation

THE U.S. HAS ALWAYS WORRIED about falling behind in science and technology. In October, 1957, when the Soviet Union launched Sputnik, the first satellite, into orbit, Americans were stunned. With the Soviets’ supposedly better-trained and educated scientists and engineers, it seemed just a matter of time until that country surpassed the U.S. both militarily and economically.

In the 1980s, the designated bogeyman was Japan, which excelled in manufacturing while devoting 2.5% of its gross domestic product to nondefense research and development. The U.S., spending only 1.8% of GDP on civilian R&D, seemed sure to become a technological laggard.

Of course, the predictions of imminent doom never came true. The scientific and engineering strengths of the Soviet Union and Japan were offset by abysmal weakness in governance and finance. Meanwhile, the U.S. responded effectively to both challenges, beefing up the resources devoted to innovation and education and reinforcing its position as the leading technological and economic power.

NOW IT’S TIME for another round of paranoia, with India and China playing the villains. China is running massive manufacturing trade surpluses with the U.S. Meanwhile, India seems to be absorbing big chunks of the U.S. info-tech job market, as politicians and corporate leaders warn darkly of endless supplies of inexpensive Indian engineers taking help-desk and programming jobs once held by U.S. workers. What’s more, as U.S. companies open research centers in India, there are fears of a “giant sucking sound”—to use a phrase H. Ross Perot once applied to Mexico—as even high-end IT jobs leave the U.S.

Before abandoning ourselves to Perot’s nightmare, let’s do a reality check. First, any upgrade of the Indian and Chinese economies is an unalloyed good for the over 2 billion people living in those countries. These are poor nations finally climbing the ladder of economic development.

Second, there’s no evidence of a major flight of educated jobs from the U.S. The Bureau of Labor Statistics reports that employment of college-educated workers has increased by
3.6% in the past year, despite a stagnant overall job market. And info-tech hiring has finally turned up, with employment in computer and mathematical occupations growing by 152,000 since June.

Still, the U.S. can’t be complacent. As India and China ascend the economic ladder, the U.S. must do all it can to bolster its strength in innovation. That’s how the country can create well-paying new jobs. Even if some research is done in India, Russia, or Japan, U.S. scientific and financial leadership will ensure the strength of the domestic economy.

Thus, the U.S. needs to focus on improving the four key components of innovation: R&D spending, education, finance for invention, and the national willingness to take risks. Here’s what should be done in each of these areas.

**Boost government spending on R&D.**
Adding $10 billion or more to government civilian R&D spending—a roughly 20% hike—should seem like a no-brainer. After all, R&D is the starting point for all technological innovation. In particular, basic research and early-stage applied research is quite properly the province of government.

But federal spending on R&D has not kept pace with the economy’s growth. Figures from the National Science Foundation show that government R&D outlays fell from 0.96% of GDP in 1992 to 0.67% in 2000 before bouncing back up again over the past few years. But even the latest rebound in federal R&D spending has been concentrated almost entirely in the areas of defense and health. In fact, federal spending on civilian nonhealth areas such as energy has risen much slower than GDP over the past 10 years.

**Add funding for graduate science and engineering students.** It’s impossible to do cutting-edge research without PhDs in science and engineering—and that’s a competitive advantage for the U.S. in the 1990s was its financial markets. Venture capital, high-yield bonds, and initial public offerings provided market financing for innovative tech companies on an unsurpassed scale, which helped create enormous numbers of new jobs in the U.S.

Still, continuing reports of corruption threaten to undermine the U.S. financial edge. That means it’s necessary to aggressively prosecute corrupt individuals and companies while adopting a philosophy of transparency that gives investors the information they need to make good decisions.

The U.S. shouldn’t cripple the flexibility of its financial system with too much regulation, though. The U.S. IT industry prospered in the ’90s by using stock options to attract top talent from all over the world; they came because of the chance to win big if their company went public. Thus, it’s counterproductive to make it harder for innovative companies and startups to use stock options to compensate their employees.

**Strengthen anew our willingness to take risks.** The financial bust, the 2001 terrorist attacks, and the struggles in Iraq combined to wound U.S. optimism. Rather than embracing innovation, Americans seem to be concerned with adopting protectionist measures and trying to hold on to existing jobs.

Rather than worrying about IT positions going offshore, the U.S. should focus on generating new jobs—in new industries—at home. In the end, an open economy, a commitment to invest in innovation and education, and a willingness to take risks will lead to success for Americans and for the U.S. economy. Together, those factors turned the “jobless economy” of the early 1990s into a boom with a 4% unemployment rate. They will work today as well.
Can India’s economy really take off? That’s the most important question to ask as the West wakes up to the power of Bangalore’s human capital. Plenty of skeptics say no. Their position: India can crank out all the software it wants, but that won’t relieve the misery of hundreds of millions of farmers, factory hands and unemployed—the vast disenfranchised class of the country. The skeptics sure can proffer plenty of stats. Here’s one: India’s service exports are expected to generate 24 million jobs by 2020. But 200 million young people will be entering the workforce during the same period. Looks like an unbridgeable gap. Huge, complex, and poor, far more dependent on the vagaries of the monsoon than on investment from Microsoft Corp.: That’s India’s destiny, they say.

But it isn’t. To find out why, take a drive along the new Bombay-Pune highway. It shoots out of the city’s crowded northern mouth and snakes around and through the steep hills of the Western Ghats. Flowering bougainvillea line the median. Once the road leaves Bombay it can take a car as little as 50 minutes to reach Pune—compared with three hours three years ago. Because of the highway, Pune can ship its goods efficiently and link up with the outside world. As a result, it’s one of India’s new boom towns and is exporting globally both software and manufactured goods such as auto parts. Similar highways are creating smaller boomlets in forgotten pockets of the country, where the poor for the first time aspire to a better life.

NO HIGHWAY, NO WEALTH. A new road, a new chance. Three years ago, no one thought India, with its inefficiency, rigid bureaucracy, and corruption, could build such projects. But it did, pushed by Prime Minister Atal Bihari Vajpayee. And it’s building more: roads, airports, schools, hospitals. Twelve years after an acute financial crisis forced India onto the path of reform, the country finally seems ready to build a robust economy, inspired by the example of Bangalore’s global software success. “It may feel like the temperature has only risen a couple of degrees so far, but this heralds the end of India’s economic Ice Age,” says Vivek Paul, vice-chairman of Wipro Ltd., India’s largest software-services company.

If India does take off, it will be because of its chaotic, robust democracy, not in spite of it. True, the system has at times tolerated corruption in politics and business. But decades of democracy and affirmative action have also allowed participation of the poorest in the system and have brought them to national power after centuries of repression. For the poor, the most potent cure for poverty is education. That is resulting in a surge in school spending in the villages. Young Indians today get five more years of schooling, on average, than their parents, and there is nearly universal primary education.

Even some of India’s past follies are turning into sources of strength. Socialism and import-substitution, for instance, held the economy back. But they also produced generations of entrepreneurs who had to develop indigenous products, from shampoos to satellites, with their own resources. That self-reliance is benefiting India now: In the past two years, six companies have won prestigious Deming quality awards, and their excellence has triggered a surge in export orders.

It’s not just business that has learned a few lessons. New Delhi has abandoned its attempts to micromanage the economy. It has steadily lowered interest rates, eased up forex restrictions, and freed banks from their obligation to lend to agriculture and favored state companies. That has made the rupee virtually convertible, with Indian business largely free to invest where it chooses, while credit has become so affordable that it has resulted in a consumer boom.

India's transformation is still a work in progress. The problems of illiteracy, poor infrastructure, and bad government persist. But something else is there, too: self-confidence. By 2015, 55% of Indians will be under the age of 20, and this generation will have grown up in an economy where roads like the Pune highway are the rule, not the exception. Unlike the generation before them, young Indians are no longer obsessed with India’s poverty, but with its future. They give India a fighting chance.