

*The High-Tech City in
Hyderabad that houses several
leading U.S. IT firms*



TECHNOLOGY FAST FORWARD

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Technology is an area of cooperation that promises to bring the U.S. and India together in ways never imagined. Some sensitivities remain but these are being handled with a new-found maturity and understanding. Barely eight years ago, information technology (IT) in India was an arcane science except in a few wired outposts. Over the last few years, however, it has become an icon of India's new global image and has helped accelerate U.S.-India cooperation in the high technology sector.

From the time when American companies looked for Indian techies to support low-value data entry or quick fixes for Y2K issues, the relationship between the two countries in the technology arena has been radically transformed. Even as Silicon Valley start-ups and American IT companies are increasingly being powered by expatriate Indians, in India the offshore business model is giving rise to a heated public debate in both countries and a very complex, multi-layered relationship that spans software development and business process outsourcing (BPO), including call centers, high-end software and product development for American companies.

The issue came up during Secretary of State Colin Powell's visit to Delhi in March 2004. "Outsourcing," he said, "is just a fact of life in this 21st century, global economic environment in which we live. We outsource to India. India, in some instances, outsources back to the United States when Indian businessmen ask for American lawyers or accountants or others to provide a service for Indian businesses."

But cooperation in technology is much more than outsourcing. The

ELECTRIC GROWTH

IBM OFFERS END-TO-END IT SOLUTIONS FOR ALL BUSINESS NEEDS

In 1977, given the then government nationalization drive, IBM was asked to leave India. For the company, business in India ceased almost immediately, but its interest in India continued. "From a distance, we always kept an eye on the country and its economy," says Abraham Thomas, Managing Director, IBM India. When liberalization offered IBM the opportunity to re-enter the country, it did not let its past experience get in the way. IBM re-entered India as a joint venture with the Tata Group in 1992 and later formed an independent company.

Today the company has a strong presence in India, with its offices in 12 cities. It is the only IT company in the country which offers end-to-end IT solutions helping customers with business transformation, changing the way they operate, reducing costs; serving their customers better, reducing risks and improving their competitiveness.

India is both an important market and an important research and

India is an important market, says Thomas



global delivery center for the Big Blue with over 9,000 employees. Its global delivery centers at Bangalore, Pune, Gurgaon and Calcutta, deliver "best-of-breed" technology solutions and its India Software Labs in Bangalore and Pune

focus on design, development and implementation of solutions, to IBM customers worldwide. The company also has a plant in Pondicherry that manufactures desktops and low and mid-range servers.

IBM is committed to India and its IT industry. The company has a partnering relationship with a number of educational institutions, including the IITs at Delhi, Kanpur and Chennai. It has also launched a strategic initiative, with over 100 universities to help create a software skills pool to support its customers in India. Its research lab, built in association with IIT Delhi, focuses on areas critical to expanding India's technology infrastructure, including electronic commerce, supply chain management and distribution, cellular and mobile telephone systems and distance learning. Says Thomas, "India is going to be one of our most important operations worldwide, both in terms of a growing domestic market and the way its strengths could be leveraged for our global operations."

recently issued agreement between the two countries, the Next Steps in Strategic Partnership ("Next Steps"), lays out a roadmap for expanding and deepening U.S.-India cooperation in a range of high technology areas. Kenneth Juster, U.S. Under Secretary of Commerce, visited India in late 2003 to hold discussions on trade issues related to dual-use goods and technologies, export controls and trade facilitation under the umbrella of the High Technology Cooperation Group. Historically, trade in sectors like nuclear energy, space, missile defense and technology transfers between the two countries has been highly restricted. Following the Next Steps agreement announced jointly by President George W. Bush and Prime Minister Atal Bihari Vajpayee in January 2004, cooperation in the "quartet" areas of civilian nuclear energy, civilian space programs, high technology trade and missile defense is set to increase. According to the two leaders, "Cooperation in these areas will deepen the ties of commerce and friendship between our two nations, and will increase stability in Asia and beyond."

For its part, India will remove systemic barriers to U.S. imports and put in place adequate controls on the export of sensitive goods and technologies to prevent unwanted proliferation. The easing of restrictions came after successful bilateral discussions to allay American fears about Indian nonproliferation controls and the growing Indian desire to gain access to dual-use technology from the U.S.

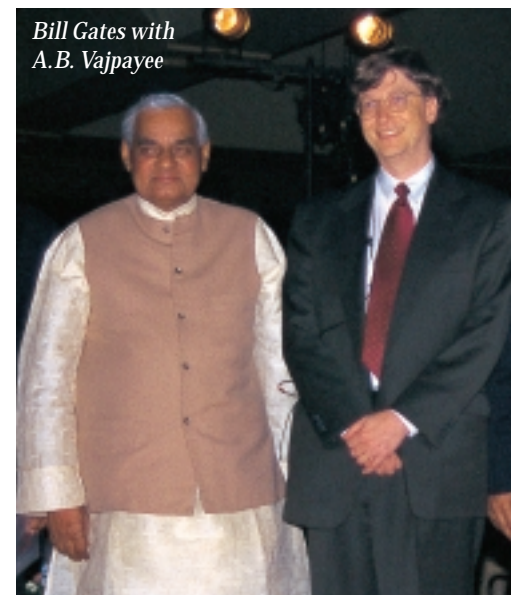
The agreement has given the bilateral high-tech train the green light. The two governments set up the High Technology Cooperation Group (HTCG) in November 2002 to push the discussions forward. Says Juster, "The 21st century will be the age of information and knowledge and we have to put in place the building blocks for greater knowledge-based trade between our two countries."

The new-found confidence in high technology exchange will ride on the robust and expanding base of existing technology-enabled partnerships between the two countries. India's IT software and services exports have been growing steadily, from Rs 8,280 crore (\$1.8 billion) in 1997-98 to around Rs 46,000 crore (\$10 billion) in 2002-03. North America remains India's largest market, accounting for over 60-65% of IT exports, a number that has tripled over the last four years.

This growth has come on the back of two crucial trends. Earlier, most Indian IT companies undertook software development on-site, primarily working at the client's office in the United States. However, with the rapid improvement of international connectivity, the development of telecom

infrastructure in India and a sharp drop in telecom tariffs, many of these companies have moved a small part of their businesses offshore (out of the company's actual back office), mainly to India.

Taking advantage of the low cost, high-quality benefit of locating development centers and back office operations in India, many Fortune 500 companies either have a presence in India or are exploring one. Not surprisingly multinational corporations (MNCs), mostly American-owned, have a 27% share in India's total IT exports. In the fast growing BPO sector, popularly referred to as IT-enabled services, the share of multinationals in exports from India is as high as 45%. Says Kiran Karnik, President, Nasscom, "First through call centers, then sophisticated development work, American companies have helped the Indian IT



SHARAD SAXENA

industry grow and get global recognition."

The presence and contribution of American companies in India's dynamic IT sector cannot be underestimated. Take Hewlett-Packard (HP), for instance. The company started its India operations in 1989, selling products and developing software. Today, having taken over Compaq's India operations in 2002, it is the largest MNC employer in India's IT sector with over 10,000 employees. With a presence in 120 cities and 16 offices, the company has a powerful footprint in India, with a hardware manufacturing unit, research lab, and software BPO operations serving its global businesses. The company's BPO unit here handles transaction processing for debit and credit card records, vendor payments, freight management and order processing for its global businesses. Says Neelam Dhawan, Vice President, Enterprise Business Group, Hewlett-Packard India, "India has become critical for HP globally."

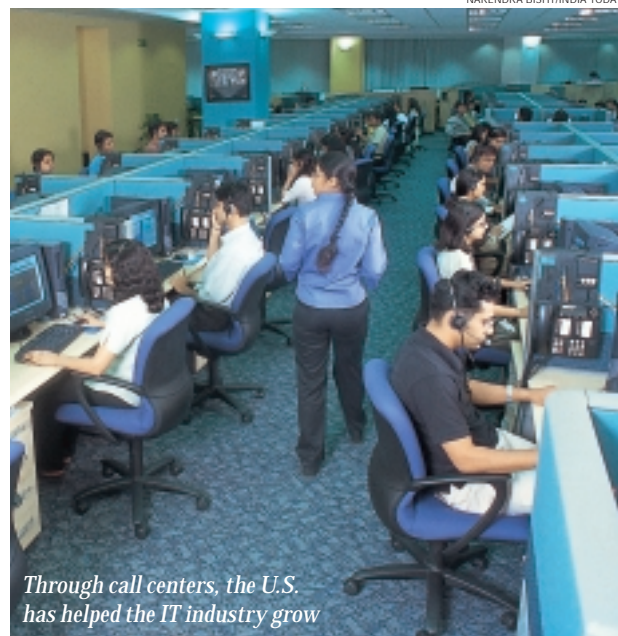
With new trust
and confidence,
U.S.-India
technological
ties seem
headed only
one way—
upward.

It is a similar story at Microsoft India. Even as Chairman Bill Gates publicly acknowledged the role of Indians, saying "20% of engineers at Microsoft are Indians," the company is ramping up its India operations. Having earmarked Rs 2,000 crore (\$435 million) in three years (its largest investment outside the U.S. excluding manufacturing activities) for boosting education, partnerships, innovation and localization in India, Microsoft is expanding its software development work in its Hyderabad office and providing support for its products and services on a global basis from Bangalore.

While IT majors like HP, Intel, IBM and Oracle are at the forefront of this growing U.S.-India high technology relationship, American companies from other sectors have also joined in significant numbers. Banks such as American Express and Citibank, financial services companies such as Lehman Brothers, and auto majors like Ford and General Motors are shifting some of their back office work to India. Meanwhile, existing American companies are using technology to escalate the scale of their operations in India. For example, the Rs 5,980 crore (\$1.3-billion) Convergys Corp, the largest call center company in the U.S., which set up shop in India in 2001, already has close to 5,000 employees in India.

Advances in Internet technology and America's growing comfort level with India have inspired U.S. companies to invest in the broad

NARENDRA BISHT/INDIA TODAY



Through call centers, the U.S. has helped the IT industry grow

spectrum of BPO. Cognizant Technology Solutions started operations in India in 1994 and today has 12 development centers with close to 8,000 employees. Indian professionals manage the interactive websites of companies such as Lehman Brothers and Boeing. Apple Computer's iconic iPod was largely developed in Hyderabad. Today, the 900 engineers at Texas Instrument's Bangalore-based chip design center boast 225 patents, and the company does more than 20% of its global R&D work out of India. Intel's Bangalore campus is leading worldwide research for the company's 32-bit microprocessors for server and wireless chips. While Wall Street sleeps, Indian analysts digest the latest financial position

ORACLE

EXPANDING SPHERE OF DEVELOPMENT

FROM A HUMBLE BEGINNING, ORACLE'S INDIA UNIT HAS BECOME THE COMPANY'S MOST IMPORTANT R&D HUB OUTSIDE AMERICA, WITH A PRESENCE IN 28 STATES AND PRODUCTS IN 11 LANGUAGES.

VIVAN MEHRA



Dasgupta heads one of the largest MNCs in India

with record delivery time and impressive results, India has emerged as the company's most important R&D hub outside the U.S. Engineers at Oracle's India Development Center work on all four Oracle product families—database, application server, collaboration suite and Oracle E-Business suite. With their counterparts on the other side of the globe, American and Indian development teams work on joint projects round-the-clock, taking advantage of the 13fi hours time difference between California and India in order to pass development, support and consulting projects between teams overnight. Indian development teams belong to the same organization as their U.S. counterparts and have as much input into product design and direction as

When Shekhar Dasgupta joined Oracle India in 1992, the company had three employees and operated out of a small satellite office in Delhi. Eleven years later, the company has become one of the largest MNCs in the country, with more than 5,000 employees and offices and development centers in Gurgaon, Bangalore, Hyderabad, Mumbai, Chennai and Calcutta. In terms of revenue, India is Oracle's fifth largest market in Asia, up from tenth two years ago. India accounts for Oracle's largest research and development investment outside the U.S. and more than 80% of Oracle employees in India work at Oracle's India Development Center. "I know we have just scratched the tip of the iceberg," says Dasgupta, Managing Director, Oracle India. The company's Indian operations are expanding rapidly. Oracle expects to increase its employee count to 6,000 soon and, in anticipation, is building new offices in Calcutta and Mumbai and expanding its Hyderabad facility.

Oracle was among the first multinationals to establish core software development operations in Bangalore in 1994 to support its global product development strategy and address local market needs. Its India Development Center began work on a project basis for different divisions of the company. But

developers at the company's headquarters in Redwood, California. "We have always believed in India and its excellent talent pool," says Dasgupta.

In addition to providing software development for the entire Oracle product family for Indian and global markets, Oracle India has become host to a number of other functions critical to Oracle's operations as a global company. Through the six facilities of Oracle India, headquartered out of Gurgaon, the company offers sales, marketing, consulting, education and support to local customers. Additionally, the company hosts a number of global operations that make it possible for the company to conduct round-the-clock operations. Besides, the Global Support Center in India is one of four such centers in the world catering to Oracle customers.

India has also been a good market. It is Oracle's fifth largest and one of the fastest growing markets in Asia, in terms of revenue. With presence in 28 states and offering products in 11 Indian languages, the company today has a customer base of 6,200. "There are enough opportunities and advantages that India offers for us to keep growing," says Dasgupta.

APPLE'S iPod

PORTAL PLAYER

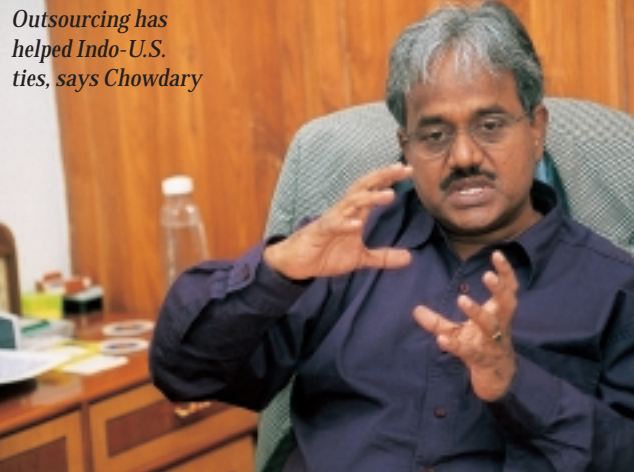
PINEXE SYSTEMS HAS THE DISTINCTION OF DEVELOPING APPLE'S AUDIO JUKEBOX FROM SCRATCH AND IS NOW WORKING ON A SIMILAR PRODUCT WITH VIDEO FEATURES.

Along the winding hilly terrain, amid elegant buildings, J.A. Chowdary is out in the greens getting some fresh air. At times, such mid-work breaks can turn into a full-fledged cricket match on a pitch just outside the Pinexe Systems India office in Hyderabad. "Such breaks are important for our boys to think and work outside the box. It boosts their creative juices," says Chowdary, Managing Director, Pinexe Systems.

It definitely does. Apple's famous iPod, a hand-held digital music jukebox that was the hottest Christmas gift in 2002, was designed and engineered here. The product was developed from scratch at the Hyderabad center by a team of 80 engineers in a record time of one and half years with an investment of Rs. 9.2 crore (\$2 million). That is half the development time and one-fifth of the cost it would have taken anywhere else in the world. Interestingly, iPod was designed in Hyderabad, marketed from Cupertino, California and is manufactured in Taiwan.

A. PRABHAKAR RAO

Outsourcing has helped Indo-U.S. ties, says Chowdary



Having developed Apple's portable audio jukebox, which has 70% global market share, the India center is now giving the finishing touches to a similar product with video features. For Chowdary, Apple's iPod marks a journey from one extreme to another. In 1994, when he took an IT delegation to Las Vegas as director of Hyderabad's Technology Park, response from American MNCs was one of absolute indifference. But today, things have come full circle. Pinexe Systems was established to capitalize on the outsourcing trend to India. Says Chowdary, "Such outsourcing moves have provided tremendous synergy and have given new meaning to U.S.-India ties."

of U.S. companies and file reports in time for the next trading day. General Electric (GE) and American Express' Indian staff authorize payments for their international vendors and help their companies assess the credit risk of their customers worldwide for loans and mortgage approvals.

New Internet and communication technologies permit U.S. companies to leverage capacity, cost and productivity opportunities in India. Outsourcing has become a fact of life in this 21st century, global economic environment. A vast pool of English-speaking, technically qualified labor, coupled with lower production costs are helping spur this growth.

GE offers an excellent example. It started seriously looking at the Indian market during the 1990s and pioneered the software-sourcing model here. In 2002, with 22,000 employees in India, revenues and orders exceeded Rs 4,600 crore (\$1 billion). Its John F. Welch Technology Center in Bangalore, which employs 1,800 engineers, does fundamental research for most of GE's 13 divisions. Engineers here have filed for 95 patents in the U.S. since its inception in 2000. Says Pramod Bhasin, President & CEO, GE Capital International Services, "We are in India not as much because of the costs but for the huge intellect base that India has."

Adobe's development center, which started in 1998 in Noida, has become a critical hub for the company's global R&D efforts. Contributing up to 18% of the parent company's engineering



PRAKASH SINGH/AFP PHOTO

(From left) FICCI Director-General Amit Mitra, former Indian Foreign Secretary Kanwal Sibal and U.S. Under Secretary of Commerce for Industry and Security Kenneth Juster

needs, the division has successfully developed such path-breaking Adobe products as Page Maker 7, Acrobat Reader for hand-held devices, Photo Deluxe and Album Starter. It is little wonder that the company's Indian unit is currently in an expansion mode. "Corporate America has started recognizing India's strengths and talent base," says Naresh Gupta, Managing Director, Adobe Systems India.

India is also emerging as a market for companies retailing personal computers (PCs), servers and routers, albeit at a slower pace. PC penetration in India may have been a mere 9 per 1,000 people in 2002-03, far below the global average of 30 per 1,000, but India's huge population makes up for that in terms of market size. Sales of PCs in the Indian market are touching 2 million units every year. American companies like HP-Compaq, Dell and IBM are today among the leading players in India's desktop market. In fact with the growth in the market, IBM has doubled the capacity at its plant in Pondicherry.

India's lowering of import tariffs has helped. From a high of 22% in 1996 import tariffs have come down to 15% today and, by 2005, all customs tariffs on computers and devices are scheduled to be removed. Retailers are gearing up for the future, with industry estimates putting computer penetration in India at 70 per 1,000 by 2010.

Another factor driving growth is that the telecom infrastructure today in India has reached international standards and is one of the cheapest in the world. The entry of private players into telecom, long dominated by the public sector, has brought dramatic changes and competition continues to drive down prices. International long distance tariffs, for instance, have dropped by over 60% in the last two years.

SECRETARY POWELL ON OUTSOURCING



"Outsourcing is a natural effect of the global economic system and the rise of the Internet and broadband communications. You're not going to eliminate outsourcing. But at the same time when you outsource jobs it becomes a political issue in anybody's country. People without jobs are a political issue, so what we have to do is make sure that as we participate in outsourcing . . . not only with India, but we outsource jobs to other countries, as well. . . we have to make sure that we are at the same time creating jobs for Americans who may have been affected by outsourcing. And that's why in our discussions today with our Indian colleagues, we made the point that we also want to see greater openness to Indian markets, not as a quid pro quo to outsourcing, but just to open up markets in all directions so that when we can do something better than someone else, then that job ought to be sourced back to the United States. There's a lot of insourcing that takes place when Indian companies have the need for services that they can only find in an American law firm, in an American accounting firm, in which case it goes back to the United States."

—Secretary of State Colin Powell speaking to Indian students in New Delhi on NDTV, March 2004

While it is easy to speak of bits, broadband and computers, people are really at the heart of the growing relationship in technology between the two countries. The Indian-American community in the U.S. has doubled in the past ten years and is now over two million strong. India recently passed China to become the second largest country for legal migration to the U.S. With the total number of Indian students now almost 75,000, for the second straight year (ending in September 2003) India is the number one source of foreign students for American colleges and universities. And a large majority of these students come to study engineering and information technology.

While Indian-Americans form a mere 0.6% of the population, it is the fastest growing and wealthiest minority group. The estimated annual income of Indians in Silicon Valley alone is \$60 billion. Says Dilip Chenoy, Deputy Director-General, CII, "They helped India get on to America's radar screen."

To a large extent, the presence of well-placed Indian-Americans has pushed the countries to explore opportunities for technology exchange. For instance, Oracle became one of the first companies to set up its development center in India, largely because it had Indian-Americans in key senior positions. Similarly, when Adobe decided to set up its India center, Naresh Gupta initiated and sold the idea to the company's top management in the U.S.

Not everything is rosy, though. While infrastructure bottlenecks, including power supply, have been a perpetual problem in India, piracy and data privacy issues are also concerns for American companies. Adobe reckons that the company gets only 10% revenue from its total sales in India. The remaining 90% is lost to piracy. According to a recent U.S. study, the Seventh Annual BSA Global Software Piracy Study 2002, the piracy rate in India was an astonishing 70% in 2002. The U.S. Government is working hard with Indian authorities to strengthen the protection of intellectual property rights (IPR) and ensure India establishes mechanisms to ensure data exclusivity for businesses.

Despite such concerns, the encouraging sign is that U.S. IT companies, while extremely focused and profit-driven, have expanded corporate responsibility into areas of social concern. On his trip to India in 2003, Bill Gates committed Rs 460 crore (\$100 million) to fighting HIV/AIDS in India. Microsoft has launched Project Shiksha, committed to computer literacy for the less fortunate and will work with the Uttaranchal and Kerala Governments in the initial round. The company



will set up an academic laboratory in each state, and the project aims to support 80,000 schoolteachers and 3.5 million students over the next five years.

Similarly at Govindpuri slum in Delhi, Intel, the world's largest chipmaker, has set up its first youth center in Asia in association with an NGO Katha. In a country known for its technical prowess, the youth center hopes to bridge the digital divide by teaching IT programs and languages to disadvantaged children. It is equipped with 24 PCs with Internet connection, web cameras and Intel microscopes. There is even a filmmaking room equipped with handycams for children.

Technology will shape human lives in the future. The same holds true for the U.S.-India relationship. With America as the biggest consumer of technology and India as an increasingly important resource base, the two countries share natural synergies. The future growth of the U.S.-India partnership in technology will require continued opening up of Indian markets to ensure more balanced trade between the two countries. As Under Secretary of State for Economic, Business and Agricultural Affairs, Alan P. Larson said on a visit to India in March 2004, "In the future, we want to build confidence for additional strategic trade to include discussions on controlled dual-use goods and technologies. This in turn will open the door for more high technology exports from the U.S. to India."

Expanding trade and investment in the high-tech area can act as a catalyst to trade in other areas. As the technology sector demonstrates its large potential for U.S.-India economic ties, other areas, such as manufacturing, agriculture, retail and food processing, will flourish as regulatory restrictions are eased. With new-found political and commercial trust and confidence, bilateral technological ties seem headed only one way—upward.