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IS YOUR JOB NEXT?

The next round of globalization is sending upscale jobs offshore. They include basic research, chip design, engineering--even financial analysis. Can America lose these jobs and still prosper?

The sense of resignation inside Bank of America is clear from the e-mail dispatch. "The handwriting is on the wall," writes a veteran information-technology specialist who says he has been warned not to talk to the press. Three years ago, the Charlotte (N.C.)-based bank needed IT talent so badly it had to outbid rivals. But last fall, his entire 15-engineer team was told their jobs "wouldn't last through September." In the past year, BofA has slashed 3,700 of its 25,000 tech and back-office jobs. An additional 1,000 will go by March.

Corporate downsizings, of course, are part of the ebb and flow of business. These layoffs, though, aren't just happening because demand has dried up. Ex-BofA managers and contractors say one-third of those jobs are headed to India, where work that costs \$100 an hour in the U.S. gets done for \$20. Many former BofA workers are returning to college to learn new software skills. Some are getting real estate licenses. BofA acknowledges it will outsource up to 1,100 jobs to Indian companies this year, but it insists not all India-bound jobs are leading to layoffs. Cut to India. In dazzling new technology parks rising on the dusty outskirts of the major cities, no one's talking about job losses. Inside Infosys Technologies Ltd.'s impeccably landscaped 22-hectare campus in Bangalore, 250 engineers develop IT applications for BofA. Elsewhere, Infosys staffers process home loans for Greenpoint Mortgage of Novato, Calif. Near Bangalore's airport, at the offices of Wipro Ltd., five radiologists interpret 30 CT scans a day for Massachusetts General Hospital. Not far away, 26-year-old engineer Dharin Shah talks excitedly about his \$10,000-a-year job designing third-generation mobile-phone chips, as sun pours through a skylight at the Texas Instrument Inc. research center. Five years ago, an engineer like Shah would have made a beeline for Silicon Valley. Now, he says, "the sky is the limit here." About 1,600 km north, on an old flour mill site outside New Delhi, all four floors of Wipro Spectramind Ltd.'s sandstone-and-glass building are buzzing at midnight with 2,500 young college-educated men and women. They are processing claims for a major U.S. insurance company and providing help-desk support for a big U.S. Internet service provider--all at a cost up to 60% lower than in the U.S. Seven Wipro Spectramind staff with PhDs in molecular biology sift through scientific research for Western pharmaceutical companies. Behind glass-framed doors, Wipro voice coaches drill staff on how to speak American English. U.S. customers like a familiar accent on the other end of the line.

Cut again to Manila, Shanghai, Budapest, or San Jose, Costa Rica. These cities--and dozens more across the developing world--have become the new back offices for Corporate America, Japan Inc., and Europe GmbH. Never heard of Balazs Zimay? He's a Budapest architect--and just might help design your future dream house. The name SGV & Co. probably means nothing to you. But this Manila firm's accountants may crunch the numbers the next time Ernst & Young

International audits your company. Even Bulgaria, Romania, and South Africa, which have a lot of educated people but remain economic backwaters, are tapping the global market for services. It's globalization's next wave--and one of the biggest trends reshaping the global economy. The first wave started two decades ago with the exodus of jobs making shoes, cheap electronics, and toys to developing countries. After that, simple service work, like processing credit-card receipts, and mind-numbing digital toil, like writing software code, began fleeing high-cost countries. Now, all kinds of knowledge work can be done almost anywhere. "You will see an explosion of work going overseas," says Forrester Research Inc. analyst John C. McCarthy. He goes so far as to predict at least 3.3 million white-collar jobs and \$136 billion in wages will shift from the U.S. to low-cost countries by 2015. Europe is joining the trend, too. British banks like HSBC Securities Inc. have huge back offices in China and India; French companies are using call centers in Mauritius; and German multinationals from Siemens to roller-bearings maker INA-Schaeffler are hiring in Russia, the Baltics, and Eastern Europe.

The driving forces are digitization, the Internet, and high-speed data networks that girdle the globe. These days, tasks such as drawing up detailed architectural blueprints, slicing and dicing a company's financial disclosures, or designing a revolutionary microprocessor can easily be performed overseas. That's why Intel Inc. and Texas Instruments Inc. are furiously hiring Indian and Chinese engineers, many with graduate degrees, to design chip circuits. Dutch consumer-electronics giant Philips has shifted research and development on most televisions, cell phones, and audio products to Shanghai. In a recent PowerPoint presentation, Microsoft Corp. Senior Vice-President Brian Valentine--the No. 2 exec in the company's Windows unit--urged managers to "pick something to move offshore today." In India, said the briefing, you can get "quality work at 50% to 60% of the cost. That's two heads for the price of one."

Even Wall Street jobs paying \$80,000 and up are getting easier to transfer. Brokerages like Lehman Brothers Inc. and Bear, Stearns & Co., for example, are starting to use Indian financial analysts for number-crunching work. "A basic business tenet is that things go to the areas where there is the best cost of production," says Ann Livermore, head of services at Hewlett-Packard Co., which has 3,300 software engineers in India. "Now you're going to see the same trends in services that happened in manufacturing."

The rise of a globally integrated knowledge economy is a blessing for developing nations. What it means for the U.S. skilled labor force is less clear. At the least, many white-collar workers may be headed for a tough readjustment. The unprecedented hiring binge in Asia, Eastern Europe, and Latin America comes at a time when companies from Wall Street to Silicon Valley are downsizing at home. In Silicon Valley, employment in the IT sector is down by 20% since early 2001, according to the nonprofit group Joint Venture Silicon Valley.

Should the West panic? It's too early to tell. Obviously, the bursting of the tech bubble and Wall Street's woes are chiefly behind the layoffs. Also, any impact of offshore hiring is hard to measure, since so far a tiny portion of U.S. white-collar work has jumped overseas. For security and practical reasons, corporations are likely to keep crucial R&D and the bulk of back-office operations close to home. Many jobs can't go anywhere because they require face-to-face contact with customers. Americans will continue to deliver medical care, negotiate deals, audit local companies, and wage legal battles. Talented, innovative people will adjust as they always have. Indeed, a case can be made that the U.S. will see a net gain from this shift--as with previous globalization waves. In the 1990s, Corporate America had to import hundreds of thousands of immigrants to ease engineering shortages. Now, by sending routine service and engineering tasks to nations with a surplus of educated workers, the U.S. labor force and capital can be redeployed

to higher-value industries and cutting-edge R&D. "Silicon Valley doesn't need to have all the tech development in the world," says Doug Henton, president of Collaborative Economics in Mountview, Calif. "We need very-good-paying jobs. Any R&D that is routine can probably go." Silicon Valley types already talk about the next wave of U.S. innovation coming from the fusion of software, nanotech, and life sciences.

Globalization should also keep services prices in check, just as it did with clothes, appliances, and home tools when manufacturing went offshore. Companies will be able to keep shaving overhead costs and improving efficiency. "Our comparative advantage may shift to other fields," says City University of New York economist Robert E. Lipsey, a trade specialist. "And if productivity is high, then the U.S. will maintain a high standard of living." By spurring economic development in nations such as India, meanwhile, U.S. companies will have bigger foreign markets for their goods and services.

For companies adept at managing a global workforce, the benefits can be huge. Sure, entrusting administration and R&D to far-flung foreigners sounds risky. But Corporate America already has become comfortable hiring outside companies to handle everything from product design and tech support to employee benefits. Letting such work cross national boundaries isn't a radical leap. Now, American Express, Dell Computer, Eastman Kodak, and other companies can offer round-the-clock customer care while keeping costs in check. What's more, immigrant Asian engineers in the U.S. labs of TI, IBM, and Intel for decades have played a big, hidden role in American tech breakthroughs. The difference now is that Indian and Chinese engineers are managing R&D teams in their home countries. General Electric Co., for example, employs some 6,000 scientists and engineers in 10 foreign countries. GE Medical Services integrates magnet, flat-panel, and diagnostic imaging technologies from labs in China, Israel, Hungary, France, and India in everything from its new X-ray devices to \$1 million CT scanners. "The real advantage is that we can tap the world's best talent," says GE Medical Global Supply Chain Vice-President Dee Miller.

That's the good side of the coming realignment. There are hazards as well. During previous go-global drives, many companies ended up repatriating manufacturing and design work because they felt they were losing control of core businesses or found them too hard to coordinate. In a recent Gartner Inc. survey of 900 big U.S. companies that outsource IT work offshore, a majority complained of difficulty communicating and meeting deadlines. As a result, predicts Gartner Inc. Research Director Frances Karamouzis, many newcomers will stumble in the first few years as they begin using offshore service workers.

A thornier question: What happens if all those displaced white-collar workers can't find greener pastures? Sure, tech specialists, payroll administrators, and Wall Street analysts will land new jobs. But will they be able to make the same money as before? It's possible that lower salaries for skilled work will outweigh the gains in corporate efficiency. "If foreign countries specialize in high-skilled areas where we have an advantage, we could be worse off," says Harvard University economist Robert Z. Lawrence, a prominent free-trade advocate. "I still have faith that globalization will make us better off, but it's no more than faith."

If the worries prove valid, that could reshape the globalization debate. Until now, the adverse impact of free trade has been confined largely to blue-collar workers. But if more politically powerful middle-class Americans take a hit as white-collar jobs move offshore, opposition to free trade could broaden.

When it comes to developing nations, however, it's hard to see a downside. Especially for those countries loaded with college grads who speak Western languages, outsourced white-collar work

will likely contribute to economic development even more than new factories making sneakers or mobile phones. By 2008 in India, IT work and other service exports will generate \$57 billion in revenues, employ 4 million people, and account for 7% of gross domestic product, predicts a joint study by McKinsey & Co. and Nasscom, an Indian software association.

What makes this trend so viable is the explosion of college graduates in low-wage nations. In the Philippines, a country of 75 million that churns out 380,000 college grads each year, there's an oversupply of accountants trained in U.S. accounting standards. India already has a staggering 520,000 IT engineers, with starting salaries of around \$5,000. U.S. schools produce only 35,000 mechanical engineers a year; China graduates twice as many. "There is a tremendous pool of well-trained people in China," says Johan A. van Splunter, Philips' Asia chief executive. William H. Gates III, for one, is dipping into that pool. Although Microsoft started later than many rivals, it is moving quickly to catch up. In November, Chairman Gates announced his company will invest \$400 million in India over the next three years. That's on top of the \$750 million it's spending over three years on R&D and outsourcing in China. At the company's Beijing research lab, one-third of the 180 programmers have PhDs from U.S. universities. The group helped develop the "digital ink" that makes handwriting show up on Microsoft's new tablet PCs and submitted four scientific papers on computer graphics at last year's prestigious Siggraph conference in San Antonio. Hyderabad, India, meanwhile, is key to Microsoft's push into business software.

This is no sweatshop work. Just two years out of college, Gaurav Daga, 22, is India project manager for software that lets programs running on Unix-based computers interact smoothly with Windows applications. Daga's \$11,000 salary is a princely sum in a nation with a per capita annual income of \$500, where a two-bedroom flat goes for \$125 a month. Microsoft is adding 10 Indians a month to its 150-engineer center and indirectly employs hundreds more at IT contractors. "It's definitely a cultural change to use foreign workers," says Sivaramakichenane Somasegar, Microsoft's vice-president for Windows engineering. "But if I can save a dollar, hallelujah."

Corporations are letting foreign operations handle internal finances as well. Procter & Gamble Co.'s 650 Manila employees, most of whom have business and finance degrees, help prepare P&G's tax returns around the world. "All the processing can be done here, with just final submission done to local tax authorities" in the U.S. and other countries, says Arun Khanna, P&G's Manila-based Asia accounting director.

Virtually every sector of the financial industry is undergoing a similar revolution. Processing insurance claims, selling stocks, and analyzing companies can all be done in Asia for one-third to half of the cost in the U.S. or Europe. Wall Street investment banks and brokerages, under mounting pressure to offer independent research to investors, are buying equity analysis, industry reports, and summaries of financial disclosures from outfits such as Smart Analyst Inc. and OfficeTiger that employ financial analysts in India. By mining databases over the Web, offshore staff can scrutinize an individual's credit history, access corporate public financial disclosures, and troll oceans of economic statistics. "Everybody these days is drawing on the same electronic reservoir of data," says Ravi Aron, who teaches management at the Wharton School at the University of Pennsylvania.

Architectural work is going global, too. Fluor Corp. of Aliso Viejo, Calif., employs 1,200 engineers and draftsmen in the Philippines, Poland, and India to turn layouts of giant industrial facilities into detailed specs and blueprints. For a multibillion-dollar petrochemical plant Fluor is designing in Saudi Arabia, a job requiring 50,000 separate construction plans, 200 young

Filipino engineers earning less than \$3,000 a year collaborate in real time with elite U.S. and British engineers making up to \$90,000 via Web portals. The principal Filipino engineer on plumbing design, 35-year-old Art Aycardo, pulls down \$1,100 a month--enough to buy a Mitsubishi Lancer, send his three children to private school, and take his wife on a recent U.S. trip. Fluor CEO Alan Boeckmann makes no apologies. At a recent meeting in Houston, employees asked point-blank why he is sending high-paying jobs to Manila. His response: The Manila operation knocks up to 15% off Fluor's project prices. "We have developed this into a core competitive advantage," Boeckmann says.

It's not just a game for big players: San Francisco architect David N. Marlatt farms out work on Southern California homes selling for \$300,000 to \$1 million. He fires off two-dimensional layouts to architect Zimay's PC in Budapest. Two days later, Marlatt gets back blueprints and 3-D computer models that he delivers to the contractor. Zimay charges \$18 an hour, vs. the up to \$65 Marlatt would pay in America. "In the U.S., it is hard to find people to do this modeling," Zimay says. "But in Hungary, there are too many architects."

So far, white-collar globalization probably hasn't made a measurable dent in U.S. salaries. Still, it would be a mistake to dismiss the trend. Consider America's 10 million-strong IT workforce. In 2000, senior software engineers were offered up to \$130,000 a year, says Matt Milano, New York sales manager for placement firm Atlantis Partners. The same job now pays up to \$100,000. Entry-level computer help-desk staffers would fetch about \$55,000 then. Now they get as little as \$35,000. "Several times a day, clients tell me they are sending this work off shore," says Milano. Companies that used to pay such IT service providers as IBM, Accenture, and Electronic Data Services \$200 an hour now pay as little as \$70, says Vinnie Mirchandani, CEO of IT outsourcing consultant Jetstream Group. One reason, besides the tech crash itself, is that Indian providers like Wipro, Infosys, and Tata charge as little as \$20. That's why Accenture and EDS, which had few staff in India three years ago, will have 5,000 each by next year. Outsourcing experts say the big job migration has just begun. "This trend is just starting to crystallize now because every chief information officer's top agenda item is to cut budget," says Gartner's Karamouzis. Globalization trailblazers, such as GE, AmEx, and Citibank, have spent a decade going through the learning curve and now are ramping up fast. More cautious companies--insurers, utilities, and the like--are entering the fray. Karamouzis expects 40% of America's top 1,000 companies will at least have an overseas pilot project under way within two years. The really big offshore push won't be until 2010 or so, she predicts, when global white-collar sourcing practices are standardized.

If big layoffs result at home, corporations and Washington may have to brace for a backlash. Already, New Jersey legislators are pushing a bill that would block the state from outsourcing public jobs overseas. At Boeing Co., an anxious union is trying to ward off more job shifts to the aircraft maker's new 350-person R&D center in Moscow (see story).

The truth is, the rise of the global knowledge industry is so recent that most economists haven't begun to fathom the implications. For developing nations, the big beneficiaries will be those offering the speediest and cheapest telecom links, investor-friendly policies, and ample college grads. In the West, it's far less clear who will be the big winners and losers. But we'll soon find out.

[Going Abroad](#)

Aerospace Engineer

Boeing has used aeronautics specialists in Russia to design luggage bins and wing parts on 777 aircraft. Next: Possible joint development of new commercial aircraft. OFFSHORE SALARY: \$650/month for master's in math or aeronautics. U.S. COUNTERPART: \$6,000/month.

Chip Designer

Engineers in India and China mainly used to write code for chips designed in the U.S. Now they develop devices for Texas Instruments, Intel, and others. With new computer-design tools, they will soon do entire systems on a chip. OFFSHORE SALARY: \$1,000/month in India with master's and five years' experience. U.S. COUNTERPART: \$7,000/month.

Architect

Computer-generated sketches for everything from major industrial plants to suburban homes are being converted into blueprints by architects in the Philippines, Hungary, Chile, and other nations. OFFSHORE SALARY: \$250/month in the Philippines. U.S. COUNTERPART: \$3,000/month and up.

Financial Analyst

U.S. brokerages, investment banks, and rating agencies are buying equity research and industry reports from finance specialists in India. They mine the same databases available to Wall Street. OFFSHORE SALARY: \$1,000/month in India. U.S. COUNTERPART: \$7,000/month and up.

Accountant

Big corporations are having bookkeeping, such as accounts receivables, done in Ireland, India, and the Philippines and are shifting work on taxes and financial reports there, too. Soon, offshore accountants may do everything but on-site audits. OFFSHORE SALARY: \$300/month in Philippines with master's. U.S. COUNTERPART: \$5,000/month and up.

Globalization Goes White Collar

A global pool of skilled workers...

NUMBER OF NATURAL-SCIENCE AND ENGINEERING COLLEGE GRADUATES

	-----BAS-----		---MAs and PhDs---	
	1989	1999	1989	1999
CHINA	127,000	322,000	19,000	41,000
INDIA	165,000	251,000	64,000	63,000
PHILIPPINES	40,000	66,000	255	937
MEXICO	32,000	57,000	340	63,000
U.S.	196,000	220,000	61,000	77,000

Data: National Science Foundation, BusinessWeek

...is drawing more Western companies that are eager to cut costs...

COMPANY	NO. OF WORKERS AND COUNTRY	TYPE OF WORK MOVING
ACCENTURE	5,000 in the	Accounting, software,

CONSECO	Philippines by 2004 1,700 in India, 3 more centers planned	back-office work Insurance claim processing
DELTA AIR LINES FLUOR	6,000 contract workers in India, Philippines 700 in the Philippines	Airline reservations, customer service Architectural blueprints
GENERAL ELECTRIC	20,000 in India alone by yearend; big China R&D center	Finance, IT support, R&D for medical, lighting, aircraft
HSBC INTEL MICROSOFT	4,000 in China, India 3,000 in India by 2005 500 in India, China by year end	Credit-card, loan processing Chip design, tech support Software design, IT support
ORACLE	Doubling India staff to 4,000	Software design, customer support, accounting
PHILIPS	700 Chinese engineers in China	Consumer electronics R&D
PROCTER & GAMBLE	650 in Philippines, 150 in China	Tech support, accounting

Data: Gartner Inc., McKinsey & Co., Forrester Research Inc.,
BusinessWeek

...a trend that's likely to grow

NUMBER OF U.S. JOBS MOVING OFFSHORE*

	2005	2010	2015
LIFE SCIENCES	3,700	14,000	37,000
LEGAL	14,000	35,000	75,000
ART, DESIGN	6,000	14,000	30,000
MANAGEMENT	37,000	118,000	288,000
BUSINESS OPERATIONS	61,000	162,000	348,000
COMPUTER	109,000	277,000	473,000
ARCHITECTURE	32,000	83,000	184,000
SALES	29,000	97,000	227,000
OFFICE SUPPORT	295,000	791,000	1,700,000
TOTAL	588,000		3,300,000

* To low-wage countries such as India, China, Mexico, and the
Philippines Data: Forrester Research Inc.

MAP: A WORLD OF OUTSOURCING

PHOTO (COLOR): NEW DELHI: WHITE-COLLAR WORKERS AT WIPRO

SPECTRAMIND

PHOTO (COLOR): INDIA DHARIN SHAH TEXAS INSTRUMENTS SALARY: \$10,000 The
designer of 3G phone chips sees no reason to move to Silicon Valley

PHOTO (COLOR): HUNGARY BALAZS ZIMAY ARCHITECT PAY: \$18/HOUR Zimay can
design your dream house from Budapest--for half what draftsmen in the U.S. charge

PHOTO (COLOR): PHILIPPINES MARIBETH MEDINA SGV, ERNST & YOUNG
STARTING PAY: AROUND \$4,000 Manila number-crunchers work on the books of U.S.
companies

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