BusinessWeek online

Close Window

SEPTEMBER 27, 2004

INTERNATIONAL COVER STORY

Tech's Future

With affluent markets maturing, tech's next 1 billion customers will be Chinese, Indian, Brazilian, Thai... In reaching them, the industry will be deeply transformed

In recent months, the Andhra Pradesh province in southern India has been the site of a rash of farmer suicides. Drought and low-quality seeds have left poor farmers with failed crops and no way to pay their debts. Many have swallowed lethal doses of pesticides as their only escape. Government officials estimate the toll since May at more than 60.

Against this bleak backdrop, a ray of hope: Neelamma, a 26-year-old woman, has found opportunity as a new type of entrepreneur. She's one of a dozen itinerant photographers who walk the streets of their farming communities carrying small backpacks stuffed with a digital camera, printer, and solar battery charger. As part of an experiment organized by Hewlett-Packard Co. (**HPQ**), Neelamma and the others are able to double their family incomes by charging the equivalent of 70 cents apiece for photos of newborns, weddings, and other proud moments of village life.

To make this happen, HP had to throw out its notions of how the tech business works. Anand Tawker, the company's director of emerging-market solutions in India, and his colleagues wrestled with fundamental questions: Does computing technology have a place in villages where electricity is fitful? Could it improve people's lives? How could villagers living in poverty pay for the latest digital wonders? And they came up with answers. In place of standard electricity, HP designers created the portable solar charger. Instead of selling the gear outright, HP rents the equipment to the photographers for $9 a month. "We asked people what they needed. One thing kept coming up: 'We want more money in our pockets,'" says Tawker. "So we do experiments. We launch and learn."

Why go to all that trouble? The answer is fast becoming obvious. During the first 50 years of the info-tech era, about 1 billion people have come to use computers, the vast majority of them in North America, Western Europe, and Japan. But those markets are maturing. Computer industry sales in the U.S. are expected to increase just 6% per year from now to 2008, according to market researcher IDC. To thrive, the industry must reach out to the next 1 billion customers. And many of those people will come not from the same old places but from far-flung frontiers like Shanghai, Cape Town, and Andhra Pradesh. "The robust growth opportunities are clearly shifting to the developing world," says Paul A. Laudicina, managing director at management consultant A.T. Kearney Inc.

Tech companies are scrambling to cash in on what they hope will be the next great growth wave. Led by China, India, Russia, and Brazil, emerging markets are expected to see tech sales surge 11% per year over the next half decade, to $230 billion, according to IDC. What makes these markets so appealing is not just the poor, but also the growing ranks of the middle-class consumers. Already, there are 60 million in China and 200 million in India, and their numbers are growing fast. These newly wealthy consumers are showing a taste for fashionable brands and for products every bit as capable as those available to Americans, Japanese, and Germans.

That tantalizing opportunity is drawing all of tech's big players. Microsoft is hawking software in Malaysia, Intel is pushing its chips in India, Cisco Systems is in Sri Lanka, and on and on. IBM says emerging markets are now a top

priority. "We'll be even more aggressive," says IBM Chief Executive Samuel J. Palmisano. In Brazil, where IBM's revenues just zoomed past $1 billion, Big Blue plans on hiring 2,000 people and spending an additional $100 million on market development.

A Rival in Every Port

For tech's giants, this is the equivalent of America's basketball stars playing Argentina in the Olympics under international rules. The leaders are just as vulnerable to upset because they're facing companies that grew up in these markets and know them intimately. Just look to China, where homegrown Lenovo Group Ltd. has fought off Dell and other invaders to remain the top PC player. The Western powers may be accustomed to dominating in the developed world, but as the competition shifts to new terrain, their lock on the future is far from secure. They face stiff challenges from service companies in India, online gaming pioneers in Korea, security outfits in Eastern Europe, and network gearmakers in China. Even mighty Microsoft is vulnerable. Open-source software, with growing support in developing countries, could stunt its growth.

The closest historical precedent for what's happening now is the PC revolution of the late 1970s and early 1980s. Before the PC, computers were the province of technical druids in giant corporations and government offices. Then with Apple Computer Inc. (**AAPL**)'s Macintosh and IBM's PC, the tech industry underwent a huge market-expanding shift. Computers began to show up on the desktops of everyone from schoolchildren to small-business owners. The result was seismic change. Microsoft, Intel, and Dell became the new champions, while dinosaurs like Digital Equipment lumbered off to the tar pits. Now, with rapid diffusion of technology into emerging economies, the industry is again reaching a gigantic new audience. And a new generation of companies will try to kick their elders in the teeth.

Expect a power shift from West to East. That's because the PC-centric era, dominated by U.S. companies, is fast giving way to the wireless age. The trend is most apparent in Asia, where cell phones with Net access are the computing gizmo of choice. While 30 million PCs are expected to be sold there this year, that pales in comparison to the 200 million cell phones capable of handling e-mail and Web surfing that researcher Yankee Group projects. That gives an advantage to Korea's Samsung Group and LG, which make cell phones as well as PCs. In the past four years they've come from nowhere to become the No. 3 and No. 6 mobile-phone makers in the world. "In the 20th century the torch came across the Atlantic from Europe to America. Now the torch is crossing the Pacific," says Geoffrey A. Moore, managing director at tech consultancy TCG Advisors LLC.

The challenges of succeeding in emerging markets are forcing the Western powers to come up with bold new strategies. They're under pressure to innovate like crazy, pioneer new ways of doing business, and outmaneuver their feisty new competitors. "The pattern in the past was to sell the same stuff to the same kind of customers. But that won't work, and it has to change," says C.K. Prahalad, business professor at the University of Michigan Business School and author of *The Fortune at the Bottom of the Pyramid*, a book about commerce in the developing world. "What's required is a fundamental rethinking of how to design products and make money."

The result is an outpouring of innovation, from both the old guard and the up-and-comers, that could rival that of the PC era. The Indian photographer's setup is just the start. New innovations designed for the developing world range from the Simputer, a durable handheld being sold in India, to e-Town, a package of all of the products and services rural Chinese towns need to provide Net access for their residents. And who would have thought up a cell phone designed for the world's 1.4 billion Muslims? Nobody -- until now. Tiny Dubai-based Ilkone Mobile Telecommunication has just started selling a phone that not only comes loaded with the Koran but also alerts people at prayer times and, with the help of a compass, points them toward Mecca.

Developing countries require new business strategies as well as new products. Most families in rural China or India can't afford a PC. In many instances, a handful of computers have to be shared by a whole village to be economically feasible. A new class of businesses -- tech kiosk operators -- is emerging to provide computing as a service. With cash often in short supply, pay-as-you-go programs are not only boosting cell-phone usage but are catching on with computers and Web access as well.

When these technologies cycle back into the mature markets, it could change everything from pricing to product design. To succeed in the developing world, devices and software have to be better in many ways: cheaper, easier to use, extra-durable, more compact -- and still packed with powerful features. The resulting improvements will

ultimately benefit everybody from New Delhi to New York. One possibility: HP is testing a solar fabric with itinerant photographers in South Africa that costs 80% less than the traditional solar panels that they use in India and won't crack. If this works out, people around the world could recharge their portable electronics by dropping them into carrying cases made of the material.

Creating Consumers

For tech's powerhouses, this shift to emerging markets cuts both ways. They have a chance to round up many new customers, but only if they're smarter than their new competitors. They'll have to invest substantial sums of money up front. Yet, for many products, prices will of necessity be very low. While the first billion customers produced an industry with more than $1 trillion in annual revenues, sales for the second billion won't be anything close to that. And ultimately, lower prices in the emerging markets will put pressure on prices everywhere. You could end up with an industry that, while it delivers a lot of value to a lot of people, it won't be able sustain the revenue growth rates or the profit margins of its glorious past.

On the brighter side, tech's spread into emerging markets could have a snowball effect on the world economy and the tech industry's fortunes. Investments in technology stoke national economies -- boosting productivity, gross domestic product, and consumption of all sorts of products, including more technology. And as computer-factory workers in China and software programmers in India increase their incomes, they become consumers. A.T. Kearney figures that the number of people with the equivalent of $10,000 in annual income will double, to 2 billion, by 2015 -- and 900 million of those newcomers to the consumer class will be in emerging markets. "If you have a middle class that provides a sufficient market for consumer goods, you have the basis for rapid industrial expansion and jobs for poor people," says Sarbuland Khan, head of the information-technology task force at the U.N. "It becomes a virtuous cycle rather than a vicious cycle."

Strategic Rethinking

Cintia Arantes and Eduardo Severino de Santana are the embodiment of that hope. The Brazilians, both 22, grew up poor in Recife, on the country's northeastern coast. But both are climbing the social ladder thanks to a local program that trains disadvantaged Brazilian youths in computer skills. De Santana, who had been unemployed last year, quickly turned one computer course into a job helping to manage the tech facilities at a national law firm.

Arantes' trajectory could take her even higher. Her laborer father doesn't have steady work, so she helps support the family of six by working nights at a phone company call center. Thanks to a tip from a teacher at a school where she was an administrative assistant, she started taking computer courses last year. Now she's an intern at a local software company in the mornings, takes courses in the afternoon, and hopes to enter a university computer engineering program next year. Her goal: to become a programmer. "I'll keep on battling until I get there," she vows. In the meantime, she's trying to save up the $700 or so it would cost to buy a PC.

In many cases, tech companies will only succeed in emerging markets if they're willing to ditch the strategies that made them successful in the developed world. Take Dell. In 2000 it introduced a consumer PC in China, called SmartPC, that was different from any it had sold before. It came preconfigured rather than built to order, and it was manufactured not by Dell but by Taiwanese companies. At less than $600, the SmartPC has helped Dell become the top foreign supplier in China. Its share of the PC market there rose from less than 1% in 1998 to 7.4% today.

Still, Dell is anything but the dominant force in China that it is in the U.S. A key reason is that Dell's practice of selling direct to customers, over the Net or the phone, doesn't work very well in the Middle Kingdom. Chinese typically want to lay their hands on computers before they buy them. That means the best way to reach them is via vast retailing operations -- the strength of local players Lenovo and Founder Electronics, which both rank ahead of Dell with market shares of 25.7% and 11.3%, respectively, according to IDC. Dell set up kiosks to demonstrate its SmartPC and other products. But in August, it backed off from the low end of the consumer market in China in the face of competitors selling stripped-down PCs for as little as $362. "In the fastest-growing large market in the world, the local PC makers are winning," says Philippe de Marcillac, a senior vice-president at IDC.

Cultural Customization

There's no easy formula for selling in emerging markets. Some corporate or government customers in Russia and Brazil are as big as any in the U.S., and their needs are just as sophisticated. Russian Railways, with 1.2 million employees, spent $2 billion over the last three years building a modern data communications system. "We're very

proud," says Anna Belova, deputy minister of the railway. "We have a huge scale of tasks, and we find creative solutions." Now other giant Russian enterprises see it as a role model and are boosting their tech purchases, too.

To target innovations that will resonate in these markets, companies are conducting in-depth studies of peoples' needs. Intel, for instance, has a team of 10 ethnographers traveling the world to find out how to redesign existing products or come up with new ones that fit different cultures or demographic groups. One of its ethnographers, Genevieve Bell, visited 100 homes in Asia over the past three years and noticed that many Chinese families were reluctant to buy PCs, even if they could afford them. Parents were concerned that their children would listen to pop music or surf the Web, distracting them from school work.

Intel turned that insight into a product. At its User-Centered Design Group in Hillsboro, Ore., industrial designers and other specialists created "personas" of typical Chinese families and pasted pictures that Bell had taken of Chinese households on their walls. They even built sample Chinese kitchens -- the room where a computer is most often used. The result: Late this year, Intel expects a leading Chinese PC maker to start selling the China Home Learning PC. It comes with four education applications and a physical lock and key that allows parents to prevent their kids from goofing off when they should be studying.

Many products designed for consumers and small businesses in emerging markets will have to fit some demanding specifications: They need to be simple to use and capable of operating in harsh environments. A handful of products have already come out with these factors in mind -- and many more are on the way. India's TVS Electronics Ltd., for instance, is selling a new kind of all-in-one business machine called Sprint designed especially for that country's 1.2 million small shopkeepers. It's part cash register and part computer, designed to tolerate heat, dust, and power outages. The cost: just $180 for the smallest of three models.

Pricing is often the make-or-break factor. In rural South Africa, where HP has set up a pilot program similar to the one in India for developing technologies for poor people, the average person makes less than $1 a day. Clearly, not too many can afford to buy their own personal computers. HP's solution? The 441 PC (as in four users for one computer). It's a machine set up in a school or library that connects to four keyboards and four screens, so multiple people can get on the Net or send e-mail at the same time.

Some of the best ideas for the developing world have the potential for catching on everywhere -- including the U.S. It's already starting to happen. Kishore Kumar first developed a simple PC-based remote health-monitoring system for distant villages in his native India. Now his company, TeleVital Inc. of Milpitas, Calif., is marketing the technology in the States. The first U.S. customer, Battle Mountain General Hospital in Battle Mountain, Nev., couldn't afford patient-monitoring equipment -- or people to operate it. Now it's hooking up with a hospital 100 miles away to track its patients. Says Battle Mountain administrator Peggy Lindsey: "We in rural America can really use equipment like this."

When tech companies modify their existing products for emerging markets, they can end up with improvements that have a broader impact. That's what happened at Nokia Corp. (**NOK**) when it set out to reduce the costs of setting up and operating wireless telephone networks. One improvement, called Smart Radio technology, can cut in half the number of signal-transmission sites operators need. Wrap that and other new technologies together, and operators can build networks for up to 50% less than before. Nokia has been rolling out these innovations from Thailand to Peru. DTAC, the No. 2 Thai cellular operator, is installing the new gear around Bangkok. "If this works, we can use this concept to penetrate into much more remote areas up-country," says Sigve Brekke, the company's co-CEO.

Dell already has translated emerging-market innovations into successes in its traditional markets. After SmartPC took off in China, Dell in 2001 introduced a version for the U.S., for the first time going after bargain hunters. A year later, Dell absorbed the SmartPC into its mainstream consumer product line as sales took off. "We try to take some of the best ideas we have seen that are happening in local environments and make it a global product," says Dell Senior Vice-President William J. Amelio.

Dell, Nokia, and other Western giants need all of the innovations they can muster, especially as the field of competition shifts to emerging markets, and they're confronted by a stampede of aggressive challengers. Chinese communications-equipment maker Huawei is giving Westerners fits in its home market, where it has captured a 16% share in the crucial router business, second only to mighty Cisco, according to IDC. And thanks to prices up to 50%

lower than rivals', Huawei is expanding everywhere from Russia to Brazil. It already ranks No. 2 worldwide in broadband networking gear, says market researcher RHK. "Huawei is being very aggressive," says Cicero Olivieri, director of engineering and planning for GVT, a large telecom company in Brazil.

Momentum Shift

The most serious challenge lies ahead. Huawei is pouring money into Internet Protocol version 6, or IPv6, the standard for the next-generation of the Internet that will have more security, speed, and capacity. China is planning to adopt IPv6 more rapidly than any other country in the world. And if Huawei's close ties to the Chinese government help it become the early leader in the technology, it could get the jump on rivals such as Cisco, Alcatel (**ALA**), and Lucent (**LU**). "The Ciscos of the world will have to change their business models to compete -- and try to out-innovate these small, nimble companies," says William Nuti, a former Cisco senior vice-president and now CEO of Symbol Technologies.

Throughout the developing world, new players are popping up like obstacles in a *Super Mario Brothers* game. Take the online game business itself. Upstart NCsoft has taken advantage of Korea's lead in broadband penetration to build the world's largest online game business, with more than 5 million monthly subscriptions. NCsoft CEO Kim Tack Jin is now expanding in Taiwan, China, Japan, and the U.S. -- where 228,000 copies of its *City of Heroes* game were sold in the first three months after its April release, according to market researcher NPD Group. The key to NCsoft's success: It has come up with a combo of fantasy and action gaming that's a hit with players.

Even mighty Microsoft is vulnerable to the competitive threats. Linux is emerging as a viable alternative to its Windows in developing markets and could cut into its market share. China, Japan, and Korea are collaborating on a version of the free open-source software package. A number of governments are considering policies that favor open-source software packages, and one, Israel, has already decided to stop using Microsoft's products. While that affects only tens of thousands of government workers, if other countries take the same path, millions of their employees could end up using open-source software, rather than Windows and Office.

Microsoft doesn't have an answer -- at least not yet. In October the company, which declined to comment for this story, will begin to sell a cheaper Windows in Thailand, Indonesia, and Malaysia in an effort to beat back the open-source threat. But it so far refuses to follow suit in China -- where it has had four general managers in six years. "Business as usual won't work there. They have to find new ways to do things," warns Jack Gao, who ran Microsoft China from 1999 to 2003 and now heads up software maker Autodesk's China operations.

It may turn out that patience is the most important attribute for tech companies trying to get things going in emerging markets. IBM, after all, has been in Brazil for 87 years. Hewlett-Packard has spent three years establishing pilot programs in India and South Africa, and, finally, they're starting to yield products and to improve the lives of the locals. Take Neelamma, the itinerant photographer. She has become a star in the two-room house with a dirt floor that she and her stonecutter husband, Krishnamurthy, share with his parents and brother. What are Neelamma's dreams? "I want to buy a television and a ceiling fan. And I want to build a small photo studio in my home," she says. One young woman's life and aspirations have been changed by the arrival of technology. Another 1 billion new consumers may not be too far behind.

By Steve HammWith Manjeet Kripalani in Bombay, Bruce Einhorn in Hong Kong, Andy Reinhardt in Paris, and bureau reports