

One Billion Laptops

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by [Kevin Maney](#)

What began as a do-gooder effort in the Third World has quietly become cutthroat competition. Now one firm, Intel, has broken ranks with other behemoths trying to develop technology that is both affordable to buy *and* build.



Kristin Peterson, co-founder and Chief Development Officer of Inveneo, rides along a dirt road en route to a small clinic to do a site evaluation assessing technology needs for possible future Inveneo computers in clinics in Rwanda on Friday, October 26, 2007.

Photograph by: Paul Taggart/World Picture News

Inveneo's offices, next to the Virgin Megastore on Market Street in San Francisco, have the feel of a small-town plumbing-supply company. Beat-up desks and tables in the three-room headquarters are surrounded by piles of boxes, electronic equipment scattered on the floor, and two stray hand trucks. Kristin Peterson, who runs the place, wears her blond hair in a pixie cut; her typical work attire is a green long-sleeve T-shirt, jeans rolled up to her calves, and running shoes. But in such humble trappings beats the heart of a revolution that threatens the tech industry's superpowers. Inveneo and a handful of similar operations—such as One Laptop Per Child, which hopes to make \$100 computers—are a nightmare for [Microsoft](#), [Intel](#), and [Dell](#) because such ventures could blow a massive hole in computer prices and win over the next wave of new computer and internet users.

In the next decade, the most explosive growth in technology will come from “the next billion users”—the industry's label for that huge slice of the global population that so far hasn't been able to afford PCs and network connections. (About 1.2 billion of the world's 6.6 billion people currently use the internet—generally speaking, the wealthiest 1.2 billion people.) Inveneo is a nonprofit working to bring computing and the internet to people who have never touched a mouse pad, in places such as a refugee camp in Uganda. Inveneo's computers run a Linux-based operating system on a cheap chip made by [Advanced Micro Devices](#) intended for photocopiers. The Inveneo machines, including a router to connect to the internet and e-mail, cost \$400 or less, depending on how many are ordered, and consume so little power they can run off a car battery. Why does that worry Bill Gates? Machines made by Inveneo and O.L.P.C. might allow the next billion first-time computer buyers to get online without ever using Microsoft Windows software, Intel chips, or Dell computers.

The implications of that could be dire for Microsoft: it could be cut off from the next decade's hottest tech market. And you can be sure that Microsoft, Dell, and the rest have done the math. They are now scrambling to get into this game. "Seven years ago, when we first approached companies to ask for their help, they'd dismiss [our idea] and tell us to go down the hall to the grants department," says Rey Ramsey, C.E.O. of One Economy, another non-profit working to deliver information technology to impoverished regions. "Around three years ago, there started to be a flip. Now they see there are legitimate business reasons to be in this space."

The tech powers need to defend themselves, which helps explain the constant stream of "next billion" initiatives they are pitching in press conferences. Their programs are always sheathed in high-minded spin, typically including language about "closing the digital divide" and "getting poor villagers out of poverty by giving them information technology." But behind the lofty goals is a ruthless analysis of the bottom line. Last year, Intel committed \$1 billion to its World Ahead program; in April, Microsoft chairman Bill Gates traveled to Beijing to unveil his company's Unlimited Potential operation. The primary aim of both projects is to bring technology to schools in developing nations. Dell and Lenovo both recently unveiled cheap computers for the Chinese. Only [Hewlett-Packard](#) seems to be missing from the dash to "do well by doing good," as the business-chic aphorism goes.

There's no reason to be entirely cynical about the motivations of these companies. "Long-term, are they jockeying for position? Of course," says Inveneo's Peterson. "Are they doing this only to get into these markets? No way. They are very committed to helping."

Still, big organizations in a brutally competitive industry don't simply decide to simultaneously launch high-profile public-service programs just because it's What Jesus Would Do. Behind the curtain, the tech behemoths know they have to get their hooks—and software—into the developing world before some cheaper, good-enough rival technology gets there first.

[Nicholas Negroponte](#), a famous and well-connected tech provocateur, provided the industry's Big Bang four years ago. At the World Economic Forum in Davos, Switzerland, Negroponte stood up before world leaders and announced his plan to build a \$100 laptop that could be given to tens of millions of impoverished schoolchildren in developing nations. After two decades of running the Massachusetts Institute of Technology Media Lab, Negroponte started O.L.P.C.—not, as he says, to throw a bomb at the tech industry, but because he believes that information technology can [save developing-world children](#) from poverty. At the time, Microsoft, Intel, and most other tech companies had only small, disjointed next-billion programs in place.

In September, O.L.P.C. began selling its XO machines for \$188, nearly double the original target price. O.L.P.C. still hopes to hit the \$100 mark, but just hasn't reached their ideal economy of scale yet. Negroponte originally announced that he would only sell the XO to government agencies in lots of one million or more. He hasn't been able to stick to that target yet, but once he is filling orders at that scale, his costs of production will drop dramatically. O.L.P.C. forecasts that it will ship 5 to 10 million machines within the next year.

XO, like the Inveneo machine, runs an open-source operating system on an A.M.D. chip. "One by-product of what we're doing is we're going to put a lot of Linux desktop boxes out into the world," says Walter Bender, O.L.P.C.'s president. "We're not doing it because we're out to get Microsoft. But if we're half successful, we'll change the relationship between Windows and Linux."

The doomsday scenario for the tech behemoths is all too clear: If XO, Inveneo, or similar systems take hold, programmers will see a huge new market and develop open-source software applications for these machines. Hardware companies might start up in Thailand, India, or China to make XO clones and sell them in regions O.L.P.C. couldn't supply, thus spreading the platform even further. A vibrant tech ecosystem could develop—one that has nothing to do with PCs based on Microsoft and Intel products. The XO platform might even creep into Europe and the United States, infiltrating an existing industry the way small Japanese cars in the 1970s

burrowed into General Motors' market and ultimately dominated the industry.

Like [G.M.](#), the tech giants didn't see the challenge coming. "When we first saw the announcement about the \$100 laptop, it seemed quite incredible to us. How can you make a \$100 laptop?" says John Davies, a 30-year Intel veteran who runs the chipmaker's World Ahead effort. "It's a really tough goal. It made us wake up. We weren't doing what's needed in emerging markets. Maybe we can work a bit harder and go after that marketplace."

After Negroponte's 2005 announcement, Intel chairman Craig Barrett took to disparaging the new company, and Intel developed a Windows-based \$250 laptop called Classmate. Negroponte claimed, most famously in a *60 Minutes* interview in early 2007, that Intel was trying to undermine O.L.P.C. with the Classmate. By mid-2007, Intel had done a neat flip-flop and decided to support O.L.P.C. and get Intel's chips on some versions of the XO, while AMD chips are still used in the others. On January 4, Intel flipped again, pulling out of O.L.P.C. because, the company said, Negroponte insisted that Intel discontinue the Classmate.

"It's a big marketplace, and there are going to be a lot of choices (of machines) in that market," Davies says, by way of explaining Intel's change of heart. "We don't know every answer, so we decided to start trying different capabilities. Which ones play out, the market is going to tell us."

In other words, Intel caved and decided to hedge its bets to make sure A.M.D. doesn't walk away with the next-billion market.

This explains why Microsoft has closely watched Negroponte. Will Poole, who runs Microsoft's Unlimited Potential effort, had lunch with Negroponte the day before a industry conference in 2006, at which Negroponte first showed a foam model of the \$100 laptop. As Poole recalls, "I said, 'Hey, fine, I understand you want to take advantage of open source—but there's also value in commercial software Microsoft has built, and why not find a way to make both work?' □"

But Microsoft's software—Windows, Works, and Office—is bundled to sell for two to three times the cost of O.L.P.C.'s entire machine. "We're hoping to get software on it in the future, but we're not there yet," Poole says. Microsoft, which makes the software that runs 90 percent of the world's personal computers, obviously feels it must do something. In Beijing in April, Gates announced a \$3 version of Windows for students in developing countries. In September, Microsoft finally got its hands on working O.L.P.C. XO machines and started trying to figure out how to jerry-rig Microsoft software so it is compatible. "Typically, we don't take new hardware and do work to integrate Windows, so we've got an unusual challenge here," Poole says. It's clear Microsoft would not go to such extremes unless it was in red-alert mode.

As of late 2007, Microsoft had yet to find a solution. O.L.P.C. doesn't seem too worried about getting Microsoft's help, though Negroponte says it would be wrong to shut out Windows if, indeed, his laptop is supposed to be open to any software.

Meanwhile, PC manufacturers have seemed less alarmed, judging by their halfhearted efforts. [Michael Dell](#) made a trip to Shanghai in March to announce his plan to sell cheap desktops only for the Chinese market. The Dell models will cost \$300 to \$500—not a huge discount from buying a low-end desktop at an Office Depot in Peoria. "Today there are 1 billion people online worldwide, and many of the world's second billion users are right here in China," Dell said at the press conference. "We intend to earn their confidence and their business." In August, Lenovo—the Beijing-based PC maker that bought I.B.M.'s personal-computer division in 2005—introduced its \$200 desktop PC for the Chinese market. The other top-three PC maker, Hewlett-Packard, hasn't announced plans for a competitive version.

In an insurgency, revolutionaries are often backed by powerful entities that want to foment trouble for the powers that be. O.L.P.C. receives funding from A.M.D., [Google](#), and open-source software company [Red](#)

[Hat](#). While A.M.D. loudly and proudly hates Intel and would like nothing better than to elbow its rival out of the next-billion market, on the record its executives are conciliatory about Intel's decision to help rather than hinder O.L.P.C. "We're delighted Intel chose to reverse its thought process," says A.M.D. executive Dan Shine of Intel's decision to support O.L.P.C., without a hint of sarcasm. Google, which offers free online competitors to Microsoft's Word, Excel, and PowerPoint software, is in position to challenge Microsoft's applications business, and Red Hat is also a well-known Microsoft-baiter.

Inveneo receives funding from A.M.D. and [Cisco](#). As a company that makes networking equipment, Cisco aims to get as many people as possible on the internet. Funding Inveneo and other projects in developing countries helps to accomplish that goal while spreading positive vibes about Cisco's brand.

So, yes, the race combines business strategy with various levels of social responsibility. Ask around the community, and Cisco and A.M.D., in particular, have garnered respect for sincerely wanting to improve people's lives. Cisco, founded in 1984 in crime-ridden East Palo Alto, California, has had social responsibility built into its corporate culture from the beginning. Hector Ruiz, the founder of A.M.D., grew up poor in Mexico and often speaks of his drive to help others who are growing up in comparable circumstances. Ruiz launched A.M.D.'s 50x15 program—which set a goal of getting 50 percent of the global population online by 2015—years before Negroponte announced his \$100-laptop dream.

The overlapping of business and philanthropy creates a powerful dynamic in this case. Strategic concerns drive tech companies to serve markets they might otherwise have ignored. "We want these efforts to make business sense," says One Economy's Ramsey. "If they don't, they'll just be one-off things."

But nobody expects this to be a one-off. One Economy, Inveneo, and O.L.P.C. only wanted to change the world. They didn't realize they would be changing the tech industry's balance of power as well.