

The power of us

Robert D. Hof

Mass collaboration on THE INTERNET is shaking up business

The 35 employees at Meiosys Inc., a software firm in Palo Alto, Calif., didn't know they were joining a gang of telecom-industry marauders. They just wanted to save a few bucks. Last year they began using Skype, a program that lets them make free calls over the Internet, with better sound quality than regular phones, using headsets connected to their PCs. Callers simply click on a name in their Skype contact lists, and if the person is there, they connect and talk just like on a regular phone call. "Better quality at no cost," exults Meiosys Chief Executive Jason Donahue. Poof! Almost 90% of his firm's \$2,000 monthly long-distance phone bill has vanished. With 41 million people now using Skype, plus 150,000 more each day, it's no wonder AT&T and MCI Inc. are hanging it up.

How can a tiny European upstart like Skype Technologies S.A. do a number on a trillion-dollar industry? By dialing up a vast, hidden resource: its own users. Skype, the newest creation from the same folks whose popular file-sharing software Kazaa freaked out record execs, also lets people share their resources -- legally. When users fire up Skype, they automatically allow their spare computing power and Net connections to be borrowed by the Skype network, which uses that collective resource to route others' calls. The result: a self-sustaining phone system that requires no central capital investment -- just the willingness of its users to share. Says Skype CEO Niklas Zennström: "It's almost like an organism."

A big, hairy, monstrous organism, that is. The nearly 1 billion people online worldwide -- along with their shared knowledge, social contacts, online reputations, computing power, and more -- are rapidly becoming a collective force of unprecedented power. For the first time in human history, mass cooperation across time and space is suddenly economical. "There's a fundamental shift in power happening," says Pierre M. Omidyar, founder and chairman of the online marketplace eBay Inc. "Everywhere, people are getting together and, using the Internet, disrupting whatever activities they're involved in."

Collective Clamor

Behold the power of us. It's the force behind the collective clamor of Weblogs that felled CBS anchorman Dan Rather and rocked the media establishment. Global crowds of open-source Linux programmers are giving even mighty Microsoft Corp. fits. Virtual supercomputers, stitched together from millions of volunteers' PCs, are helping predict global climate change, analyze genetic diseases, and find new planets and stars. One investment-management firm, Marketocracy Inc., even runs a sort of stock market rotisserie league for 70,000 virtual traders. It skims the cream of the best-performing portfolios to buy and sell real stocks for its \$60 million mutual fund.

Although tech companies may be leading the way, their efforts are shaking up other industries, including entertainment, publishing, and advertising. Hollywood is under full-scale assault by 100 million people sharing songs and movies online via programs such as Kazaa and BitTorrent. The situation is the same with ad-supported media: Google Inc.'s ace search engine essentially polls the collective judgments of millions of Web page creators to determine the most relevant search results. In the process, it has created a multibillion-dollar market for supertargeted ads that's drawing money from magazine display ads and newspaper classifieds.

Most telling, traditional companies, from Procter & Gamble Co. to Dow Chemical Co., are beginning to flock to the virtual commons, too. The potential benefits are enormous. If companies can open themselves up to contributions from enthusiastic customers and partners, that should help them create products and services faster, with fewer duds -- and at far lower cost, with far less risk. LEGO Group uses the Net to identify and rally its most enthusiastic customers to help it

design and market more effectively. Eli Lilly & Co., Hewlett-Packard Co., and others are running "prediction markets" that extract collective wisdom from online crowds, which help gauge whether the government will approve a drug or how well a product will sell.

At the same time, peer power presents difficult challenges for anyone invested in the status quo. Corporations, those citadels of command-and-control, may be in for the biggest jolt. Increasingly, they will have to contend with ad hoc groups of customers who have the power to join forces online to get what they want. Indeed, customers are creating what they want themselves -- designing their own software with colleagues, for instance, and declaring their opinions via blogs instead of waiting for newspapers to print their letters. "It's the democratization of industry," says C.K. Prahalad, a University of Michigan Stephen M. Ross School of Business professor and co-author of the 2004 book *The Future of Competition: Co-Creating Unique Value with Customers*. "We are seeing the emergence of an economy of the people, by the people, for the people."

Peer Production

That suggests even more sweeping changes to come. Howard Rheingold, author of *Smart Mobs: The Next Social Revolution*, sees a common thread in such disparate innovations as the Internet, mobile devices, and the feedback system on eBay, where buyers and sellers rate each other on each transaction. He thinks they're the underpinnings of a new economic order. "These are like the stock companies and liability insurance that made capitalism possible," suggests Rheingold, who's also helping lead the Cooperation Project, a network of academics and businesses trying to map the new landscape. "They may make some new economic system possible."

Perhaps they already are. Yochai Benkler, a Yale Law School professor who studies the economics of networks, thinks such online cooperation is spurring a new mode of production beyond the two classic pillars of economics, the firm and the market. "Peer production," as he calls work such as open-source software, file-sharing, and Amazon.com Inc.'s millions of customer product reviews, creates value with neither conventional corporate oversight nor market incentives such as payment. "The economic role of social behavior is increasing," he says. "Things that would normally just dissipate in the air as social gestures become economic products."

Indeed, peer production represents a sea change in the economy -- at least when it comes to the information products, services, and content that increasingly drive economic growth. More than two centuries ago, James Watt's steam engine ushered in the Industrial Revolution, centralizing the means of production in huge, powerful corporations that had the capital to achieve economies of scale. Now cheap computers and new social software and services -- along with the Internet's ubiquitous communications that make it easy to pool those capital investments -- are starting to give production power back to the people. Says Benkler: "This departs radically from everything we've seen since the Industrial Revolution."

Sound pretty threatening to anyone invested in the status quo? You bet. Indeed, as the title of Rheingold's book implies, there could be a dark side to this new cooperative force, especially if it results in mob rule. Quite often, the best solution to a problem comes from the sudden flash of insight from a solitary genius such as Charles Darwin or Albert Einstein. It would be a tragedy if these folks, sometimes unpopular in their times, got lost in the cooperative crowds. Clearly, peer production has its limits. Almost certainly, it will never build railroads, grow wheat, run nuclear power plants, or write great novels.

Yet this cooperative force may spread beyond such easily shared commodities as information, knowledge, and media. People are starting to use the Net to pool tangible goods as well. In a sense, Skype enables people to share computer hardware. Thanks to the Web's ability to serve as a meeting ground and scheduling coordinator, it's becoming economical to share cars, for example. Services such as Zipcar Inc. and Flexcar let members use the Net to reserve one of a fleet of autos in crowded cities, almost on demand, for an hourly fee.

What's driving all this togetherness? More than anything, an emerging generation of Net technologies. They include file-sharing, blogs, group-edited sites called wikis, and social networking services such as MySpace and Meetup Inc., which has helped everyone from Howard Deaniacs to English bulldog owners in New York form local groups. Those technologies are finally teasing out the Net's unique potential in a way that neither e-mail nor traditional Web sites did. The Net can, like no other medium, connect many people with many others at the same time.

What sets these new technologies apart from those of the Internet's first generation is their canny way of turning self-interest into social benefit -- and real economic value. They have what tech-book publisher Tim O'Reilly calls an "architecture of participation," so it's easy for people to do their own thing: create a link on their Web site to another Web site they like; rate a song; or just show off their knowledge with an online product review. Then, those actions can be pooled into something useful to many: the 3 billion song ratings that help people create personalized Net radio stations on Yahoo! Inc. or Amazon's millions of customer-generated product reviews, which help decide hits and duds. Exclaims Amazon CEO Jeffrey P. Bezos: "You invite the community in, and you get all this help."

It's surprisingly good help, too. New research indicates that cooperation, often organized from the bottom up, plays a much greater role than we thought in everything from natural phenomena like ant colonies to human institutions such as markets and cities. It's what New Yorker writer James Surowiecki, in his illuminating 2004 book of the same name, calls "the wisdom of crowds." Crowds can go mad, of course, but by and large, it turns out, they're smarter at solving many problems than even the brightest individuals.

The Internet's supreme group-forming capability suggests the rise of an almost spooky group intelligence. Within minutes of Pope John Paul II's death, hundreds of eBay sellers had posted related products for sale. Whether it is responding to world events or new products such as Sony Corp.'s PSP game machine, eBay's hive mind reacts to shifts in demand much faster than traditional companies with layers of management approval. Although eBay recently has seen some mature markets in the U.S. and Germany slow, the group smarts have helped keep growth more than respectable, with gross merchandise sales this year expected to rise 32%, to \$45 billion. As eBay CEO Margaret C. Whitman has noted: "It is far better to have an army of a million than a command-and-control system."

More companies are starting to understand the logic. If they can get others to help them design and create products, they end up with ready-made customers -- and that means far less risk in the tricky business of creating new goods and markets. So businesses are accessing the cyberswarm to improve everything from research and development to marketing. Says Alpheus Bingham, vice-president for Eli Lilly's e.Lilly research unit: "If I can tap into a million minds simultaneously, I may run into one that's uniquely prepared."

Procter & Gamble's \$1.7 billion-a-year R&D operation, for instance, is taking advantage of collective online brain trusts such as Lilly company InnoCentive Inc. in Andover, Mass. It's a network of 80,000 independent, self-selected "solvers" in 173 countries who gang-tackle research problems for the likes of Boeing Co., DuPont, and 30 other large companies. One solver, Drew Buschhorn, is a 21-year-old chemistry grad student at the University of Indiana at Bloomington. He came up with an art-restoration chemical for an unnamed company -- a compound he identified while helping his mother dye cloth when he was a kid. Says InnoCentive CEO Darren J. Carroll: "We're trying for the democratization of science."

And apparently succeeding. More than a third of the two dozen requests P&G has submitted to InnoCentive's network have yielded solutions, for which the company paid upwards of \$5,000 apiece. By using InnoCentive and other ways of reaching independent talent, P&G has boosted the number of new products derived from outside to 35%, from 20% three years ago. As a result, sales per R&D person are ahead some 40%.

The online masses aren't just offering up ideas: Sometimes they all but become the entire production staff. In game designer Linden Lab's Second Life, a virtual online world, participants themselves create just about everything, from characters to buildings to games that are played inside the world. The 45-person company, which grossed less than \$5 million last year, makes money by charging players for virtual land on which they build their creations. Second Life's 25,000 players collectively spend 6,000 hours a day actively creating things. Even if you assume only 10% of their work is any good, that's still equal to a 100-person team at a traditional game company. "We've built a market-based, far more efficient system for creating digital content," says Linden CEO Philip Rosedale.

Likewise, groups online are starting to turn marketing from megaphone to conversation. LEGO Group, for instance, brought adult LEGO train-set enthusiasts to its New York office to check out new designs. "We pooh-poohed them all," says Steve Barile, an Intel Corp. engineer and LEGO fan in Portland, Ore., who attended. As a result, says Jake McKee, LEGO's global community-development manager, "we literally produced what they told us to produce." The new locomotive, the "Santa Fe Super Chief" set, was shown to 250 enthusiasts in 2002, and their word-of-mouth helped the first 10,000 units sell out in less than two weeks with no other marketing.

Corporate planners are even starting to use the wisdom of online crowds to predict the future, forecasting profits and sales more precisely. Prediction markets let people essentially buy shares in various forecasts, often with real money. Most famously, they've been employed in the University of Iowa's experimental Iowa Electronic Markets to determine, with remarkable accuracy, the most likely winner of the Presidential election. The ease of organizing groups on the Net has caused an explosion in their use, says Emile Servan-Schreiber, CEO of NewsFutures Inc., a consultant that has run 40,000 prediction markets for companies and publications.

Mob Mentality

Hewlett-Packard Co.'s services division was having trouble a few years ago with forecasts in the first month of a quarter. So Bernardo A. Huberman, director of HP Labs' Information Dynamics Lab, set up a market with 15 finance people not normally involved in such planning. They bought and sold virtual stock that represented a range of forecasts at, above, and below the official company forecast. Their collective bets yielded a 50% improvement in operating-profit predictability over conventional forecasts by individual managers.

For all the benefits, Net-based cooperation holds plenty of peril for the unwary. Obviously, not all crowds are wise. Even The Wisdom of Crowds author Surowiecki wonders if the Net connects like-minded people so well that it can amplify groupthink. "The more we talk to each other, the dumber we can get," he notes. Groups that discourage independent thought potentially could put a damper on out-of-the-box ideas from brilliant individuals. They can also become herds that buy or dump stocks on momentum alone. For that matter, they can devolve into lynch mobs and terrorist groups.

As companies have learned, the online hordes can quickly turn against them. Last September bike-lock manufacturer Kryptonite tried to downplay a blogger video that showed how to open its bike locks with a BIC pen. But the video instantly spread across the Net, forcing the company to spend more than \$10 million on lock replacements.

To contend with this rising people power, corporations will have to craft new roles for themselves and learn new ways to operate in order to stay relevant. They'll be unable to keep secrets for long amid the chorus of online voices, as Apple Computer Inc. learned when fan sites spilled the beans on unreleased products. Managers and employees will have to learn how to take orders from customers more than from bosses. "Networks are becoming the locus for innovation," says Stanford University professor Walter W. Powell. "Firms are becoming much more porous and decentralized."

The challenges, though, go to show that we're not talking about merely a new capitalist tool -- at least not one that's dominated by big capitalists. Upstarts, both ad hoc groups and new companies, are seizing the initiative far more than are established businesses. They're transforming industry after industry faster than individual companies can cope with.

Nowhere has that phenomenon happened faster than in software. Collaborative open-source development is rapidly moving beyond basic utility software like Linux to mainstream applications as well. An especially eye-opening example is SugarCRM Inc., which provides an open-source version of customer-relationship management software now dominated by Siebel Systems and salesforce.com Inc. The 10-person outfit's software, which CEO John Roberts calls "the collective work of bright CRM engineers around the world," has been downloaded more than 235,000 times for free.

The company makes money from services such as technical support and a \$40-a-month Web-based service, as well as more fully featured corporate software for which it charges \$239 per user per year. Scarcely a year old, SugarCRM won't reveal its finances, but its business model suggests a big change in how the software industry works. "The fact that everyone can participate [in open-source] is creating a new market ecology," says Kim Polese, CEO of SpikeSource Inc., a startup providing bundles of open-source products. Or, as Roberts adds brightly: "We're turning a \$10 billion market space into a \$1 billion market space."

The same scary prospect lies ahead for other information-based industries, such as entertainment, media, and publishing, that are rapidly going digital. People are not only sharing songs and movies -- legally or not -- but also creating content themselves and building sizable audiences. The threat comes from more than the 10 million-plus blogs. Overall, 53 million Americans have contributed material to the Net, from product reviews to eBay ratings, according to the Pew Internet & American Life Project.

The most breathtaking example: Wikipedia. Some 5 million people a month visit the free online encyclopedia, whose more than 1.5 million entries in 200 languages by volunteer experts around the globe outnumber Encyclopedia Britannica's 120,000, with surprisingly high quality. "Our work shows how quickly a traditional proprietary product can be overtaken by an open alternative," says co-founder Jimmy Wales. Unlike Britannica, Wales is not aiming to generate much, if any, revenue. But "that doesn't mean that we won't destroy their business," he notes. Britannica spokesman Tom Panelas says sheer volume of articles isn't a measure of quality and may be overload for most readers and researchers.

Then again, the cooperative crowds offer a lifeline to beleaguered media such as newspapers. The five-year-old online paper OhmyNews in South Korea has marshaled 36,000 "citizen journalists" to write up to 200 stories a day on everything from political protests to movies. Its popularity with 1 million daily visitors has made it the sixth-most influential media outlet in Korea, according to a national magazine poll -- topping one of the three television networks. "It's participatory journalism," explains founder Oh Yeon Ho, who says OhmyNews turned a profit last year. The idea is starting to catch fire in the U.S., too, via independent citizen-media efforts such as Backfence Inc. and Bayosphere and budding initiatives by E.W. Scripps Co. and others. The New York Times Co. is also testing the waters: In March, it bought About.com, which has 475 citizen experts on consumer electronics, personal finance, and other topics.

Even industries that traffic in physical goods are being turned upside down by Net-driven sharing. In retail, for instance, "consumers" are becoming active participants in the merchants they buy from, transforming the venerable suggestion box into something more influential. At Amazon.com, thousands of volunteers write buyer's guides and lists of favorite products. Amazon also lets thousands of merchants, from Target Stores to individuals, sell on Amazon pages.

What's more, Amazon is opening up the technology behind product databases, payment services, and more to 65,000 software developers. They're creating new services, such as the ability to compare brick-and-mortar store prices with Amazon's by scanning a bar code into a cell phone. Thanks in part to such moves, the company is solidly profitable on \$6.9 billion in sales last year. "We're all building this thing together -- Amazon itself, outside developers, associates, and customers," says Jeff Barr, Amazon's Web services evangelist.

That raises a key point: All of us will have to take on more responsibility. And to get the most out of the new cooperative tools and services, we'll have to contribute our time and talent in new ways -- such as rating a seller on eBay or penning a short essay in Wikipedia. But the rewards will be more personalized products and services that we don't merely consume, but help create.

Ultimately, all this could point the way to a fundamental change in the way people work together. In 1968, ecologist Garrett Hardin popularized the notion of the tragedy of the commons. He noted that public resources, from pastures and national parks to air and water, inevitably get overused as people act in their own self-interest. It's a different story in the Information Age, contends Dan Bricklin, co-creator of the pioneering PC software VisiCalc and president of consultant Software Garden Inc. in Newton Highlands, Mass. Instead, he says, there's a cornucopia of the commons. That rich reward may be worth all the disruption we've seen and all the more still to come.

THE ASCENT OF THE INTERNET

Decades after its birth, the Net is finally blossoming into a uniquely social medium

ONE-TO-ONE

Starting in the 1980s, e-mail became the first popular application on the Internet. Best for connecting two people, just like traditional mail, it has suffered with the advent of widespread spam.

ONE-TO-MANY

With the emergence of the Web browser in 1993, the World Wide Web developed into a broadcast medium. But television still plays that game much better.

MANY-TO-MANY

File-sharing, blogs, and social networking services are connecting masses of people simultaneously. Their collective efforts are spawning new services, including online encyclopedia Wikipedia and free Net phone network Skype.

THE COOPERATIVE CORPORATION

Companies are using Internet-powered services to tap into the collective intelligence of employees, customers, and outsiders, transforming their internal operations

RESEARCH

By making use of outside scientific networks, Procter & Gamble now gets 35% of new products from outside the company, up from 20% three years ago. That has helped boost sales per R&D person by 40%.

HIRING

The networking site LinkedIn lets some 2.7 million people connect to job or employee prospects through trusted friends. About 5,500 PeopleSoft employees signed up at the site before Oracle acquired the company.

PRODUCTION

Linden Lab's Second Life is largely built by the players, who collectively spend 6,000 hours a day creating objects for the online virtual world. That's equal to what a 1,000-person team in a conventional game company would produce.

MARKETING

LEGO enlists influential consumers as online evangelists. After a new locomotive kit was shown to 250 LEGO train fans, their word-of-mouth helped the first 10,000 units sell out in 10 days with no other marketing.

SALES

Eli Lilly taps into the wisdom of crowds with "prediction markets," in which groups of employees buy or sell virtual stock in various forecasts. In one experiment, they predicted the outcome of drug trials well before data were released.

Data: Procter & Gamble Co.; Linden Lab; LEGO, Informative Inc.; Eli Lilly & Co.

SHARING: THE NET'S NEXT DISRUPTION

New technologies are marshaling the talents, resources, and dollars of millions of people worldwide. That collective power is shaking up the status quo in many industries:

TELECOM

More than 41 million people use Skype software to share processing power and bandwidth, allowing them to call each other for free over the Internet. Partly as a result, combined 2005 revenues of AT&T and MCI are expected to fall by \$7.4 billion, or 15%.

SOFTWARE

Coordinating efforts online, programmers worldwide volunteer on more than 100,000 open-source projects such as Linux, challenging traditional software. Some 52% of businesses in a recent survey had replaced Microsoft's Windows server software with Linux.

RETAIL

The 61 million active members of eBay have created a new economy out of goods once relegated to antique stores and garage sales. By rating each other on most transactions, they have established a self-sustaining alternative to retail stores -- and made eBay worth \$52 billion.

FINANCE

The investment management firm Marketocracy Inc. runs a sort of rotisserie league for 70,000 virtual stock traders, using the top 100 portfolios to determine stock picks for its \$60 million mutual fund. The jury's out: After beating the market for two years, it trailed the S&P 500 in 2004.

ENTERTAINMENT

Despite legal assaults by record companies and movie studios, at least 100 million people continue to share music files online. Currently, there are about 1 billion songs available for file sharing.

MEDIA

Reversing the traditional broadcast model, more than 53 million Americans have contributed material to the Net, such as product reviews and blog postings. At least 10 million blogs, some drawing more visitors than mainstream news sites, are now read by 32 million Americans.

ADVERTISING

Search engine Google instantly polls millions of people and businesses whose Web sites link to each other, producing an entirely new ad venue that grossed \$3.2 billion last year, up 118%. That compares with an 8% increase in TV ad spending and 5% in newspapers and magazines.

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