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The End Of Management?

With experimental markets, workers are betting on their company's future — and moving in on the boss's domain

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The end of management just might look something like this. You show up for work, boot up your computer and log onto your company's Intranet to make a few trades before getting down to work. You see how your stocks did the day before and then execute a few new orders. You think your company should step up production next month, and you trade on that thought. You sell stock for the production of 20,000 units and buy stock that represents an order for 30,000 instead. All around you, as co-workers arrive at their cubicles, they too flick on their computers and trade.

Together, you are buyers and sellers of your company's future. Through your trades, you determine what is going to happen and then decide how your company should respond. With employees in the trading pits betting on the future, who needs the manager in the corner office?

That scenario isn't as farfetched as you might think. It's called a prediction market, based on the notion that a marketplace is a better organizer of insight and predictor of the future than individuals are. Once confined to research universities, the idea of markets working within companies has started to seep out into some of the nation's largest corporations. Companies from Microsoft to Eli Lilly and Hewlett-Packard are bringing the market inside, with workers trading futures contracts on such "commodities" as sales, product success and supplier behavior. The concept: a work force contains vast amounts of untapped, useful information that a market can unlock. "Markets are likely to revolutionize corporate forecasting and decision making," says Robin Hanson, an economist at George Mason University, in Virginia, who has researched and developed markets. "Strategic decisions, such as mergers, product introductions, regional expansions and changing CEOs, could be effectively delegated to people far down the corporate hierarchy, people not selected by or even known to top management."

To understand the hype, take a look at Hewlett-Packard's experience with forecasting monthly sales. A few years back, HP commissioned Charles Plott, an economist from the California Institute of Technology, to set up a software trading platform. A few

dozen employees, mostly product and finance managers, were each given about $50 in a trading account to bet on what they thought computer sales would be at the end of the month. If a salesman thought the company would sell between, say, $201 million and $210 million worth, he could buy a security — like a futures contract — for that prediction, signaling to the rest of the market that someone thought that was a probable scenario. If his opinion changed, he could buy again or sell.

When trading stopped, the scenario behind the highest-priced stock was the one the market deemed most likely. The traders got to keep their profits and won an additional dollar for every share of "stock" they owned that turned out to be the right sales range. Result: while HP's official forecast, which was generated by a marketing manager, was off 13%, the stock market was off only 6%. In further trials, the market beat official forecasts 75% of the time.

Intrigued by that success, HP's business-services division ran a pilot last year with 14 managers worldwide, trying to determine the group's monthly sales and profit. The market was so successful (in one case, improving the prediction 50%) that it has since been integrated into the division's regular forecasts. Another division is running a pilot to see if a market would be better at predicting the costs of certain components with volatile prices. And two other HP divisions hope to be using markets to answer similar questions by the end of the year. "You could do zillions of things with this," says Bernardo Huberman, director of the HP group that designs and coordinates the markets. "The idea of being able to forecast something allows you to prepare, plan and make decisions. It's potentially huge savings."

Eli Lilly, one of the largest pharmaceutical companies in the world, which routinely places multimillion-dollar bets on drug candidates that face overwhelming odds of failure, wanted to see if it could get a better idea of which compounds would succeed. So last year Lilly ran an experiment in which about 50 employees involved in drug development — chemists, biologists, project managers — traded six mock drug candidates through an internal market. "We wanted to look at the way scattered bits of information are processed in the course of drug development," says Alpheus Bingham, vice president for Lilly Research Laboratories strategy. The market brought together all the information, from toxicology reports to clinical results, and correctly predicted the three most successful drugs.

What's more, the market data revealed shades of opinion that never would have shown up if the traders were, say, responding to a poll. A willingness to pay $70 for a particular drug showed greater confidence than a bid at $60, a spread that wouldn't show if you simply asked, Will this drug succeed? "When we start trading stock, and I try buying your stock cheaper and cheaper, it forces us to a way of agreeing that never really occurs in any other kind of conversation," says Bingham. "That is the

power of the market."

The current enthusiasm can be traced in part, oddly enough, to last summer's high-profile flop of a market that was supposed to help predict future terrorist attacks. A public backlash killed that Pentagon project a few months before its debut, but not before the media broadcast the notion that useful information embedded within a group of people could be drawn out and organized via a marketplace. Says George Mason's Hanson, who helped design the market: "People noticed." Another predictive market, the Iowa Electronic Markets at the University of Iowa, has been around since 1988. That bourse has accepted up to $500 from anyone wanting to wager on election results. Players buy and sell outcomes: Is Kerry a win or Bush a shoo-in? This is the same information that news organizations and pollsters chase in the run-up to election night. Yet Iowa outperforms them 75% of the time.

Inspired by such results, researchers at Microsoft started running trials of predictive markets in February, finding the system inexpensive to set up. Now they're shopping around for the market's first real use. An early candidate: predicting how long it will take software testers to adopt a new piece of technology. Todd Proebsting, who is spearheading the initiative, explains, "If the market says they're going to be behind schedule, executives can ask, What does the market know that we don't know?" Another option: predicting how many patches, or corrections, will be issued in the first six months of using a new piece of software. "The pilots worked great, but we had little to compare it to," he says. "You can reason that this would do a good job. But what you really want to show is that this works better than the alternative."

Ultimately, "you may someday see someone in a desk job or a manufacturing job doing day trading, knowing that's part of the job," says Thomas Malone, a management professor at M.I.T. who has written about markets. "I'm very optimistic about the long-term prospects."

But no market is perfect. Economists are still unsure of the human factor: how to get people to play and do their best. In the stock market or even the Iowa prediction market, people put up their own money and trade to make more. That incentive ensures that people trade on their best information. But a company that asks employees to risk their own money raises ethical questions, so most corporate markets use play money to trade and small bonuses or prizes for good traders. "Though this may look like God's gift to business, there are problems with it," says Plott, who ran the first HP experiments. Tokyo-based Dentsu, one of the world's largest advertising firms, is still grappling with incentives for an ad forecasting market it will launch later this year with the help of News Futures, a U.S. consultancy.

And even if companies can figure out how to make their internal markets totally efficient, there are plenty of reasons that corporate America isn't about to jump wholesale onto the markets bandwagon. For one thing, markets, based on individuals and individual interests, could threaten the kind of team spirit that many corporations have struggled to cultivate. Established hierarchies could be threatened too. After all, a market implies that the current data crunching and decision-making process may not be as good as a gamelike system that often includes lower-level employees. In a sense, an internal market's success suggests that if upper managers would just give up control, things would run better. Lilly, which is considering using a market to forecast actual drug success, is still grappling with the potential ramifications. "We already have a rigorous process," says Lilly's Bingham. "So what do you do if you use a market and get different data?" Throw it out? Or say that the market was smarter, impugning the tried-and-true system?

There could be risks to individual workers in an internal trading system as well. If you lose money in the market, does that mean you're not knowledgeable about something you should be? "You have to get people used to the idea of being accountable in a very different way," says Mary Murphy-Hoye, senior principal engineer at Intel, which has been experimenting with internal markets. "I can now tell if planners are any good, because they're making money or they're not making money."

That is one reason Intel has been bandying markets about for more than two years but has yet to implement them in a real-world scenario. It's not for lack of good results. In a laboratory experiment run with M.I.T.'s Malone, Intel used a market to make a coordination decision: which factories should produce computer chips and when. In the experiment, a centralized, strategic plan was replaced with a market in which salesmen and a plant manager traded futures contracts representing chips. The result was nearly 100% efficiency in allocating manufacturing capacity. That experiment echoed another, real-life market triumph. In 1998 oil giant BP set out to reduce company-wide greenhouse emissions 10%. Instead of issuing plant-by-plant dictums, the company let plant managers trade permits to produce emissions. Managers who could quickly get their plants into compliance and reduce emissions even further could sell their permits to other plants. BP hit its reduction target — nine years early.

Success like that has made true believers out of many. But no one contests that there are risks, and markets are hardly infallible. In the stock market, frenzied buying can lead to bubbles, and day traders make money with no concern for companies' fundamentals. But if the forward march of information technology is any indication, markets will come to play an increasingly important role. No matter the industry, companies are ultimately in the business of predicting the future: what a consumer will buy, where a product can be made most cheaply, how new laws might affect profit margins. There is such an undisputed advantage to knowing the future that

corporations employ analysts and strategists, create committees and reports, conduct polls and pilots — all to figure out what will, and should, happen next. As HP's Huberman puts it, "A company that can predict the future is a company that is going to win." And if internal markets can refine those predictions, even incrementally? Well, then, the market signals a strong buy.
