

Can X Prizes Spur Innovation?

Contests such as Peter Diamandis' X Prizes offer big purses for breakthrough ideas. But can prize money do more to stimulate innovation than existing incentives?

By Steve LeVine - November 20, 2008, 5:00PM EST

By the autumn of 2001 it looked as if Peter Diamandis' luck had run out. Five years earlier, the wonkish Bronx-born doctor with dreams of being an astronaut had made headlines by promising to pay \$10 million to the first privately financed crew to fly into space. He saw the jackpot as a way to spur a private space industry, as well as a means to generate some business for himself and perhaps even a ride to the moon. True, Diamandis had nowhere near \$10 million, but he already had set up a nonprofit organization, X Prize Foundation, to run the contest and thought he could raise the money easily from corporate patrons. He was wrong. No one was willing to give away that much cash, particularly after the September 11 terrorist attacks. The contest appeared on the brink of collapse.

Today the 47-year-old Diamandis is often hailed as a visionary. After securing funding, his handsome offer ended up prompting a hoped-for space race, with Diamandis awarding the \$10 million in 2004 to a team bankrolled by Microsoft (MSFT) co-founder Paul Allen. Since then, X Prize Foundation has started three more challenges—for super-efficient cars, human genome sequencing, and lunar space flight. Diamandis and his staff now are evaluating ideas from would-be sponsors for competitions on such causes as improving health care and promoting clean energy. If the ideas are promising, the foundation would then draft rules and solicit entrants.

GENIUS AT RAZZMATAZZ

His X Prize, moreover, has become a template for organizations, companies, and even the federal government. The format: Announce an attention-grabbing goal, find a benefactor who'll put up the prize money or pay for it yourself, wait as the brightest minds race each other to come up with the answer, and then bask when you declare a winner. Today there are dozens of copycat

contests in the U.S. and Europe for everything from curing Lou Gehrig's disease to solving age-old math conundrums. Awards run from \$75,000 to \$50 million.

But as contests have proliferated, so, too, have questions about their ability to push forward the boundaries of technology. Are they better at yielding breakthroughs than traditional research and development? Can Lotto-size payouts solve monstrously complex problems? Or are they a fad that stokes vanity-driven entrepreneurs focused on smaller-scale challenges?

Diamandis, not surprisingly, predicts that cash competitions will resolve some of "the world's grand challenges." When he proposed a prize for space travel, he recalls, "a lot of people also told me it was a stupid idea and that no one could win it." But he concedes there are problems that you can't simply "throw a prize at." And at least some scientists see contests as ultimately immaterial in their fields. Richard Gibbs, director of the Human Genome Sequencing Center at Baylor College of Medicine in Houston, notes that researchers have made huge advances in understanding DNA without the lure of a sweepstakes. "The X Prize is cute," he says, "but is not really the driver." Still, he and others say what's the harm if contests generate excitement about science.

Diamandis is an unassuming yet intense plug of a man with a broad smile. Dressed in a black blazer with pointed lapels and black shirt open at the neck, shirttails out, he displays the Space Age paraphernalia that fills his office within the foundation's spacious new headquarters in Playa Vista, Calif.: a portrait of actor William Shatner from his *Star Trek* days, models of various space vehicles, and a sword commemorating Diamandis' own victory in a big contest, the \$500,000 Heinlein Prize in 2006 for contributions to the commercialization of space. A large component of the X Prize is Diamandis' genius at razzmatazz. It helps that the founder's own story resembles a parable of the triumph of persistence.

Diamandis earned a master's degree in aerospace engineering from the Massachusetts Institute of Technology in 1987 and a Harvard Medical School degree in 1989. But he cast those careers aside in 1994 to become a space-travel promoter. His X Prize Foundation—the X was initially a placeholder until he could come up with a catchier name—started as a one-man shop. He modeled his contest after the one that spurred Charles Lindbergh to fly solo across the Atlantic in 1927. Unlike backers of many of today's competitions, Diamandis didn't actually have any money to award a winner, but figured he'd find it before anyone could put a privately financed craft into space.

At the contest's low point in 2001, he bought an insurance policy that would pay the \$10 million purse. But he was so strapped, he couldn't afford the \$50,000 premium. Then a wealthy Texan named Anousheh Ansari came seemingly out of nowhere with millions of dollars from investments in telecom. She paid the premium and funded what Diamandis renamed the Ansari X Prize.

Today, Diamandis hobnobs with the likes of physicist/author Stephen Hawking and Google (GOOG) co-founders Sergey Brin and Larry Page, all backers of the current X Prize contests.

These days, patrons are knocking on Diamandis' door. "I don't make the claim that incentive prizes are a panacea," he says. But he adds that there are hundreds of billionaires on the planet. "There will come a time when you can only name so many buildings," he says. "I won't be surprised if over the next decade we see \$100 million or \$1 billion megaprizes to solve big problems. We are genetically bred to compete."

Although his name is most associated with scientific contests today, Diamandis isn't the first to see that money can be a powerful motivator. Prizes to determine how to measure longitude were around for 200 years before British clockmaker John Harrison solved the mystery in 1761. More recently, contests helped begin the canning industry, accelerate progress in the automotive industry, and produce the first computer to beat a chess grandmaster (Garry Kasparov in 1996). In the 20th century, government grants and corporate R&D budgets became the favored way to fund scientific advances, with contests almost dying out until Diamandis came along.

But can prize money do more than existing incentives? Richard Wilson, who runs the Washington University School of Medicine Genome Sequencing Center in St. Louis, isn't sure it'd do much in his field. In early November, Wilson announced a considerable breakthrough—the first decoding of the entire DNA sequence of a cancer victim. The sequencing turned up a set of previously unknown mutations that could reveal triggers of the disease. The X Prize itself is in the midst of a \$10 million competition to make genome sequencing far cheaper and faster, which could turn a person's DNA makeup into a routine health-care tool. But Wilson says he has no plans to enter the tournament. "The motivation for us is a chance to make a difference," he says. "It's the patient we have in mind. I worry that the X Prize sort of thing is much more hype than substance."

THE STRONGEST INCENTIVE? "BIG MARKETS"

A key problem with incentive prizes is that devising one—the kind that attracts capable contestants along with the media focus that motivates well-heeled sponsors to commit big money—is harder than it seems. The goal has to be tantalizing, but the odds can't be so long that the task is impossible. So far, space challenges appear to work best. For starters, there are millions of sci-fi fans around the world. Another promising field is autos, which also has plenty of enthusiasts. In 2010, Diamandis could stir up a frenzy when he promotes his high-mileage car contest with a road rally through a half-dozen U.S. cities.

Diamandis' reputation may turn on whether prize money can bring about affordable, reliable alternatives to fossil fuels. Last April his foundation said it would host a \$10 million competition for biofuels, with later awards for the creation of a clean aviation fuel, improved energy storage, and a system to provide water, electricity, and broadband service to villages in the developing world. But the group has pushed back deadlines as Diamandis' deputies studied "hundreds of ideas," says Jaison Morgan, who heads the prize development office. "There are breakthroughs, but not one bold enough for us now. We want a prize that will revolutionize things, to capture the public's imagination."

That may be too tall a challenge. The bigger the problem, the more likely that a lot of money and effort have already been spent trying to solve it, undermining the impact of even a well-endowed contest. And alternative energy is one of those pursuits that governments and private industry invest billions of dollars on every year. "The biggest incentive is big markets," says Vinod Khosla, a co-founder of Sun Microsystems (JAVA) and among Silicon Valley's largest investors in alternative energy.

Diamandis says that even in crowded spheres, his X Prize can push research in a direction it wouldn't ordinarily go. Ultimately, he wants to parlay the interest of benefactors in self-promotion into a social good—"to solve big problems and affect how people do their thinking." That's a laudable goal. But as Diamandis himself concedes, not every problem can be fixed with a contest.

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Why The Big Three Aren't in the X Race

The X Prize Foundation has attracted dozens of entrants by offering \$10 million to the first outfit that can design a 100-mile-per-gallon vehicle that can be mass produced at an affordable price. But as Eric Boyd notes on his xprizecars.com blog, none of the major carmakers has entered. Boyd, who describes himself as an entrepreneur and engineer, says that by competing, the major manufacturers would get free publicity and could even win. But he notes they risk tarnishing their reputation if they come in ninth behind a flock of startups. Besides, the prize money would be insignificant.

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