Jaison G. Morgan

Inducing Innovation Through Prizes

Today, as corporate and philanthropic interests experiment increasingly with different types of competitions to induce breakthroughs, we are experiencing a resurgence of innovation through prizes. From competitions for writing business plans to cash purses that have inspired private commercial space exploration, the power of prizes is gaining increased attention. This essay seeks to establish a common understanding of prizes, including their constraints and their potential for leveraging real outcomes.

THE MODEL OF PRIZE-INDUCED INNOVATION

When Charles Lindbergh crossed the Atlantic in 1927 to become the first pilot to fly from New York to Paris, his fame led to important developments in the budding aviation industry. Within a year, applications for pilot licenses in the U.S. increased by 300 percent; the number of licensed aircraft in the U.S. increased by 400 percent; and the number of U.S. airline passengers increased from 5,782 in 1926 to 173,405 in 1929 (a roughly 30-fold expansion).[1] While many recognize the value of Lindbergh's accomplishment as having inspired a new generation of industry, there has been relatively little focus on one of the motivating factors that drove him and others to attempt such an important breakthrough.

Lindbergh was one of nine competitors attempting to win a prize. Hotelier Raymond Orteig had offered $25,000 to the first pilot to traverse successfully the Atlantic.[2] Business interests formed to compete for the prize, stimulating a combined investment of over $400,000 from teams attempting to win the purse. Clearly the most famous of these attempts was Lindbergh's successful crossing in

Jaison G. Morgan is the lead manager of the Prize Development Department for the X PRIZE Foundation. The Department houses the intellectual property and know-how that has enabled the successful design of over $60 million of inducement prizes. Over the next five years, the Foundation plans to launch between 10-15 additional prizes, representing a combined purse value of over $300 million. Morgan holds degrees from Hampden-Sydney College (BA) and the University of Chicago (MA) and is a frequent blogger and lecturer on the continuing evolution of prizes to induce innovative breakthroughs.

© 2009 Jaison G. Morgan

the *Spirit of St. Louis*. While there were many signs of increasing opportunities in civil aviation at the time, the leverage that Raymond Orteig generated with his cash prize was a pivotal force.

Offering prizes as a financial incentive to inspire innovative breakthroughs is a time-honored model (see Text Box, p.111).[3] The most recent corollary for the Orteig Prize came from the X PRIZE Foundation, with the awarding of the Ansari X PRIZE in 2004. Once again, the model engaged commercial interests, changed public perceptions, and opened new markets.

In 1996, the X PRIZE Foundation launched the first private race to space. Frustrated with the pace of innovation from government programs, Dr. Peter Diamandis developed a competition that offered a prize to the first privately financed team that reached an altitude of 100 kilometers carrying a payload equivalent of three passengers and capable of replicating the feat twice within two weeks. He cultivated a partnership with the Ansari family, which made possible the cash purse of $10 million.

Over the course of eight years, the Ansari X PRIZE led to important developments in private space travel. Twenty-six teams from seven nations registered to compete,[4] and the combined value of their efforts exceeded $100 million.[5] The care-free reentry and cantilevered hybrid rocket motor technology developed by the winning team have both since evolved into commercial applications, and preflight sales of suborbital space tickets are showing promising interest. The winning spacecraft, *SpaceShipOne*, now hangs in the Smithsonian National Air and Space Museum next to the *Spirit of St. Louis*. Whether or not private space travel will achieve the commercial success found in other civil aviation sectors has yet to be determined, but we can attribute many critical developments in the early formation of this new industry to the Ansari X PRIZE.

Another important outcome of the Ansari X PRIZE was a renewed interest in prizes. Today, the number of new prizes is peaking at levels not seen for more than fifty years. Furthermore, the level of experimentation and innovation in prize design is being supported by an increasing variety of corporate and philanthropic sponsors. Prize sponsors are attracted by many of the strengths of the Orteig Prize and the Ansari X PRIZE, such as broad public exposure, financial leverage, and the guarantee of payment only upon providing proven results. So, as prize designers continue to experiment with novel prize constructs, we are seeing many of them attempting to replicate these strengths while also trying to mitigate the costs and risks associated with such ambitious and innovative endeavors.

A Common Prize Taxonomy

While significantly greater attention has been paid to prizes of late, relatively little attention has been paid to their wide variety. We know that the historic range of prizes and their potential for delivering outcomes is broad; therefore, it is important to establish a common framework for understanding the categorical distinc-

A Brief Sampling of Other Historic Inducement Prizes and Their Outcomes

The British Longitude Prize (1714): accurate measure of longitude aboard naval vessel
Académie de Besançon Prize for Substitute Foods (1771): use of potato as food source
Alkali Prize (1775): synthetic production of alkali for manufacturing glass, paper, soap
Napoleon Food Preservation Prize (1795): canning and preservation of food
Turbine Prize (1826): use of large-scale commercial hydraulic turbines
Liverpool & Manchester Railway Locomotive Prize (1829): passenger rail service
Confederate Prize for Inventions to Sink Warships (1861): first combat submarine
The Billiard Ball Prize (1863): invention of celluloid ball and modern plastics industry
Napoleon III Margarine Prize (1869): process for manufacturing butter substitute
RSA Laboratories Secret-Key Challenge (1997): cracking of encryption codes
Goldcorp Challenge (2000): predictive methodologies for the mining of gold
Microsoft Virus Bounty (2003): successful prosecution of computer virus creator
Cane Toad Trap Competition (2004): better trap for highly poisonous toad
Windows-on-a-Mac Prize (2006): Windows XP on a Mac with an Intel processor
Astronaut Glove Challenge (2007): highly dexterous astronaut gloves

Excerpted from Knowledge Ecology International, Research Note 2008:1; see www.keionline.org.

tions among prizes and to what degree these variations can generate innovative breakthroughs.

The Orteig Prize and the Ansari X PRIZE share a number of design strengths. In each case, the prize purse was only paid after the accomplishment had been achieved. This type of *ex ante* incentive can offer a high degree of leverage. When the purse size is significant enough to attract broad participation, multiple teams invest to develop solutions and the total value of such ventures often exceeds the cash award of the purse. Both prizes offered events and stories that were readily picked up by the press, adding a fame factor to the value of the purse and drawing greater and more diverse participation. Newcomers from fields outside of established interests provided important disruptive activity as they experimented with different materials or unorthodox methods, thereby laying fertile ground for innovation. The result of both prizes was a broad range of investment from a wide field of players, in an environment in which success was rewarded.

However, while prizes *ex ante* are gaining popularity, they are still outnumbered by their counterpart, prizes *ex post*. *Ex post* prizes, which are bestowed for accomplishments after the fact, represent the most recognizable prize category; they include the Nobel and Pulitzer prizes, Academy Awards, and many others. And while they provide great value in defining high standards of success, they are

limited in the degree of leverage or controlling influence they have over the behavior of the recipients. In fact, many of them are awarded based on subjective criteria and are therefore open to the criticism that they merely reflect the preferences and biases of those making the selection. Prizes *ex post* are significantly distinct from prizes *ex ante*.

To help navigate the prize landscape, we will chart these two prize types on opposite ends of a spectrum. As categories, they are distinct in many other important respects; for example, in practice they are much different to administer and each offers unique advantages over the other. Prizes *ex post* by design require fewer resources to operate because they eliminate the need to certify attempts for the purse. Prizes *ex ante* entail a higher degree of risk and require a more careful articulation of rules to ensure that the winner achieves the intended outcome. Apparently because of issues of cost and risk, the prize landscape has historically offered far more prizes *ex post;*[6] however, as sponsors continue to push for increased leverage, examples of new prizes that attempt to blur these lines are materializing.

Another important distinction in the landscape of prizes is between the attempt to induce tangible results and the attempt to trigger ideas or hypothetical solutions. Again, these two prize types can be plotted on either ends of a spectrum, allowing us to chart the prize landscape along two intersecting axes (see Figure 1) and provide four quadrants of prize categories.

Without the constraint of proof, challenges to develop theories or ideas have become very popular. They are often called idea contests, and they can be designed to reward either the best undiscovered concepts (*ex ante*) or the best thought leadership (*ex post*) to date across a wide range of disciplines. Idea contests typically are inexpensive to administer, and they're often highly generative in content. Today, companies like Idea Crossing[7] and Innocentive[8] are developing systems in which these prizes are increasingly more automated through social networking tools and other web-based applications. However, while many of these types of prizes are more facile and less expensive to manage, the practical application of prize-winning entries remains untested. Prizes that require proof of concept offer much greater practical application when they are designed to meet a specific challenge; however, they also represent greater costs to administer and potentially higher risk to guarantee the intended results. While the distinction between these two prize types appears clear, the same pressures of lowering costs while yielding highly relevant and productive outcomes has led to new models that blur them as categories.

BLURRING THE LINES OF THE PRIZE LANDSCAPE

One example of a prize that has effectively blurred the distinction between two prize types is the recently formed Mo Ibrahim Prize for Achievement in African Leadership, an award presented to a former political leader of an African nation who has demonstrated commanding excellence.[9] While it has been expressly designed to induce more humanitarian political leadership, it is limited by design

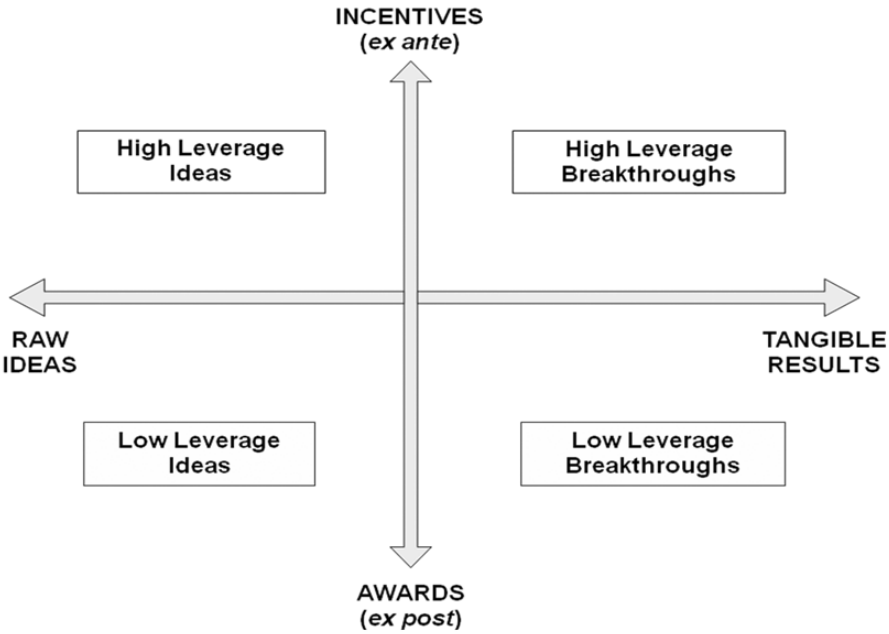

Figure 1. The Mapping the Prize Landscape.

as an *ex post* prize. Unfortunately, the only tractable recipient would realize gains after the fact and in a context where the degree of influence of the prize is immeasurable. However, the sponsor recently formed a partnership with a team at Harvard University that created the Ibrahim Index,[10] a comprehensive assessment of humanitarian leadership. By implementing such clearly defined criteria, any interested leader can now calculate their standing at any time. While the Ibrahim Index does contain subjective elements, it is clearly an attempt to bring greater objectivity and transparency to a prize *ex post*. And by successfully promoting the new standard, the prize now has the added advantage of a strong comparative framework across the range of targeted agents. The Ibrahim Index consolidates the strengths of a prize *ex post* (e.g., ensuring a high standard of excellence) while offering a unique incentive among those who would stand to benefit from it (e.g., a relative proof of excellence). The design bridges strengths of both prize types.

On the other hand, prizes *ex ante* are starting to realize the importance of certain subjective criteria as well. To ensure the adoptability and scalability of winning technologies, some prizes are calibrating the tastes of targeted prize beneficiaries. In 2005, the National Academy of Engineering offered the Grainger Challenge, a $1 million purse for the development of a device to remove arsenic from well water in developing countries. Teams competed in trials to determine the efficacy of decontamination, but the rules also included tests of "social acceptability"—a highly subjective criteria. The winner was announced in 2007, and the SONO filter has since been reported to have provided safe drinking water to over 400,000

people.[11] The coupling of prize rules that are both objective and subjective is increasingly prevalent across a wide range of new prize constructs.

Among idea contests, there is a wide variety of experimentation and innovation. The Hamilton Project on Economic Policy Innovation offers a classic example of a prize designed to elicit new ideas or policy proposals from students.[12] Winning students receive cash awards, and their submissions are published by the Brookings Institution, a leading policy think tank. These papers are used to promote discussion, and while they are required to address the practical issues confronting the particular challenge, efforts to ensure the adoption of the winning proposal are not guaranteed. In contrast, idea contests increasingly are designed so that sponsors can implement the ideas in the submissions, which represents an important bridge between hypothetical and practical outcomes. For example, the Innovation Challenge is an annual contest targeting MBA students to develop solutions needed by the sponsoring businesses, and the prizes include not only cash purses but also job opportunities for the winners to support the implementation of their proposals. Corporate interests are tapping into the enthusiasm of students to tackle their particular challenges at a fraction of what it would cost them to develop a solution internally, and they receive the benefit of all entrants, not just the winning team. While the winning team is only submitting a theory for change, resources are made available for the team to test the validity of the proposal and to turn the idea into a practical application.

An increasing number of prizes are being offered today in ways that ensure maximum leverage with the highest degree of practical application. Even as more idea contests are populating the Internet and other media outlets, the basic notion of using these models to "crowdsource"[13] innovative solutions for corporations and other interested parties is redefining the basic language of prizes. For those encouraged by the move toward more efficient and functional prize outcomes, there is a rich and growing array of options from which to learn.

Now that we have established a framework for viewing the prize landscape, we must begin to recognize patterns and use them to articulate the best practices of prize design, including some of the examples already provided. The intersection of the two axes, from *ex ante* to *ex post* (y) and from raw ideas to tangible results (x), can chart many historic or currently active variations and may prove useful in building common understanding. We must continue to look for the lessons of prize design and use them as screens in promoting successful models.

PRINCIPLES OF HIGHLY EFFECTIVE PRIZE DESIGN

After mapping the prize landscape and considering many of the valuable lessons learned from failed and successful prizes, we present some fundamental principles that embody basic issues of effective prize design.

Prizes must attract new capital to a problem. Prizes should stimulate innovation from directions orthogonal to existing financial resources and incentives or provide a massive accelerator effect. Prizes must be constructed either to address

market failures within under-financed but critical aspects of relevant sectors or to motivate the world's brightest minds to work harder, faster, or in entirely new ways.

We can find many examples of prizes where existing market forces were not sufficiently considered during the design, such as those attempting to find cures for cancer and other diseases. The $1 million prize offered by Armand Hammer in 1981 for the first person to find "a cure for some form of cancer in the next decade"[14] was never claimed. This was partly because the amount of financing and mindshare flowing into the relevant sectors was already staggering. The pharmaceutical industry is bound by costs well over $1 billion to certify new compounds, and this risk is well rewarded when a blockbuster drug is discovered. As a result of these lucrative financial incentives and the fame associated with discovering cures, the industry consistently attracts tremendous intellectual and financial capital in pursuit of these breakthroughs. The incentives are already so strong that prizes targeting the same outcomes offer little inducement and often even fail to attract meaningful participation.[15] Prizes cannot succeed without first taking into account the relevant strength of the prize purse and the current incentives already provided within the relevant sectors.

However, there are many market failures in other fields of medicine, and these are ripe areas in which to develop prizes. For example, disease prevention and detection have been less attractive than therapeutics to investors and innovators. There are also many areas of medicine in which a breakthrough would provide significant relief but where the number of beneficiaries is relatively small, leading to fewer economic incentives for investors. For example, one organization focused on generating breakthroughs in the diagnosis and treatment of Lou Gehrig's disease (ALS) is Prize4Life, and they offer prizes in an attempt to attract scientific and commercial interests to invest in unlocking a disease that affects only 5-10% of the U.S. population. Finally, there are a great many areas of research and development where commercial applications are not yet apparent. These and other areas of exploration are in need of disruptive breakthroughs, and offering prizes is a unique method for attracting new capital or accelerating investments to achieve desired outcomes.

Well-designed prizes offer incentives in areas where traditional investors or corporate interests are not heavily engaged. These targeted areas for innovation can be ignored for many reasons, such as insufficient consumer interest, difficult challenges in ensuring time to market, or even lack of a clear indication of possible return on investment. In these instances, prizes can offer a unique advantage by stimulating interest from new directions and from parties who are not encumbered by the challenges of a prevailing industry.

Prizes must tackle complex, cross-disciplinary challenges. Prizes must engage innovators who otherwise would be unlikely to tackle the problems that the prize is designed to address. Prizes must be designed to attract new people entering fields with nontrivial approaches, using new resources and collaborating in unique ways.

One of the most famous prizes is the British Longitude Prize.[17] In 1714, the British Empire had been unsuccessful in finding a method to accurately measure longitude aboard naval vessels, and worldwide navigation and maritime trade were suffering. So, the government offered a series of prize purses to induce a solution. The rules were written in such a way as to strictly prescribe the outcome but not the particular pathway to achieving it. Surprisingly, the prize winner was a watchmaker, John Harrison, his invention the marine chronometer. Harrison was an unlikely winner because popular opinion had leaned toward astronomical charts for the solution. Harrison's success is often cited as a reason to approach prize rules in such a way as to invite nontraditional approaches and unlikely participants and to cast as wide a net as possible in drawing out the winning solution.

However, today we are learning more than any anecdote can provide about the nature of effective cross-disciplinary participation in prizes. In a study of the company Innocentive, an online prize-awarding entity, Harvard Business School professor Dr. Karim Lakhani led a team of analysts to survey the winning entrants in prize competitions.[18] They learned that the majority of the problem-solvers identified themselves as being active in highly specialized fields, but often the farther the problem was from a competitor's own field of expertise, the more likely they were to create a winning submission. They reasoned that "the significance of this effect may be due to the ability of 'outsiders' from relatively distant fields to see problems with fresh eyes and apply solutions that are novel to the problem domain but well known and understood by them."[19] So, while it remains true that prizes must be designed to invite even the most unexpected competitors, it is also true that a great deal of meaningful participation will come from specialists who are likely just as sophisticated and entrenched in their particular methods as those who have unsuccessfully been seeking the solution. The old notion that prizes should appeal to dilettantes or amateurs is being challenged, as many prize administrators are seeking durable networks in which they can find a broader diversity of expertise and specialization across as wide a range of disciplines as possible.

Prizes must capture the imagination. A prize crystallizes and articulates an issue in a way that is easily described and that engages the creative spirit of those who would participate. A well-designed prize provides a motivating, meaningful target for interested teams.

One of the most famous prizes is the British Longitude Prize. In 1714, the British Empire had been unsuccessful in finding a method to measure accurately longitude aboard naval vessels, and worldwide navigation and maritime trade were suffering. So, the government offered a series of prize purses to induce a solution. The rules were written in such a way as to prescribe strictly the outcome but not the particular pathway to achieving it. Surprisingly, the prize winner was a watchmaker, John Harrison, who invented the marine chronometer. Harrison was an unlikely winner because popular opinion had leaned toward astronomical charts for the solution. Harrison's success is often cited as a reason to approach prize rules in such a way as to invite nontraditional approaches or unlikely participants and to cast as wide a net as possible in drawing out the winning solution.

Prize designers are now considering how best to craft launch plans and media packages during the early inception of the prize idea. In fact, sponsors are demanding the broad exposure that comes with a prize, and they are focusing on how to distinguish themselves through interesting guerilla tactics and widely publicized media purchases. Recently, Wellpoint, the country's largest health-care insurance company, published a one-page advertisement in a well-known national newspaper to announce their intention to launch a prize to "fix the American health-care system." These and other interesting announcements will undoubtedly affect the way prizes are designed if expectations are defined from the outset as having a high level of creative engagement.

Prizes must overcome constraints. Prizes reconfigure what is possible by transcending other path-dependent limitations, such as social constraints, legal challenges, and policy regimes. Prizes overcome resignation and cynicism because they allow for the notion that a solution can arise from anywhere.

A recent example of a highly effective prize is the GoldCorp Challenge. In 2000, a small Toronto-based gold mining company was facing insolvency. A new owner of the company, with little or no mineral extraction experience, had been experimenting boldly with some success but was running out of solutions. Then, in an unconstrained act of experimentation, he decided to make available all of the geological data the company had compiled since 1948 to see if anyone could predict where to mine, based on assays of the information, and to give a prize to the most effective solution. Multiple cash purses were offered, and over 1,400 teams participated from 50 countries with 80 percent of 110 digging sites yielding significant quantities. An Australian company won first place using computer fractal technologies. At the time, the notion of making the data available was insane—the mining industry was a highly secretive industry that guarded such information closely. However, by breaking from the accepted constraints of the corporate culture, the prize model proved highly effective.[20]

There are many other examples of prizes designed in ways that challenged seemingly overwhelming resistance. However, by embracing the core notion that a well-defined and meaningful solution can come from anywhere, especially from areas outside of the accepted culture, we find many examples of breakthroughs that resulted from the prize. In fact, some of the most successful prizes have come out of some of the most entrenched sectors.

Prizes must provide lasting benefit and impact. The beneficial impact of prize-related activities needs to extend far beyond the duration of any one contest. Prizes should not finance a "foot race"—that is, a competition where the winner goes home with a big check but generates no lasting impact. The longevity of a prize can come from judicious design.

The recently announced Progressive Insurance Automotive X PRIZE offers a $10 million purse to the team that can produce a car with a minimum fuel efficiency of 100 miles per gallon and the lowest level of harmful emissions. These cars will participate in stage races in cities across the country. However, each team must also submit a business plan to a panel of judges that guarantees the capacity for pro-

ducing a minimum output of 10,000 units per year. There already are a great many car prototypes that meet these projected standards, but unfortunately there are too few cars available to consumers. The purpose of the prize is not to showcase technologies that are currently within reach but to bring to market a new generation of cars that consumers will want and will be able to purchase. Well-designed prizes can and should address breakthroughs where there is already significant activity, especially if the failure being addressed is the transfer of technologies into the marketplace.

Prizes must induce successful "real-world" deployment. A prize that does not address adoption among those who are responsible for implementing the intended outcome cannot succeed.

While it is important to ensure the adoption and scalability of prize outcomes, prize designers must also carefully balance the need to control costs and barriers to deployment against launching prizes with rules that are too rigid or restrictive. For example, in 1994, the Rockefeller Foundation offered a $1 million purse for a highly accurate, inexpensive, noninvasive, and fast diagnostic test for asymptomatic gonorrhea and chlamydia. The prize focused heavily on ways to ease deployment; the test had to be so simple that a person with a primary school education could administer it after two hours of training. However, because it was so narrowly defined, it ended without a winner.

In contrast, the Ansari X PRIZE sought a cost-effective and reusable space ship as a long-term outcome. Yet, as the rules evolved, it became apparent that many of the issues challenging the adoption of the winning technology required attending to price controls and the many legal entanglements that would be difficult to administer. So, the prize included a simple solution; the winning space ship had to travel up to 100 kilometers twice within two weeks, thereby ensuring that the second flight would only require fuel and touch labor costs. By finding a simply proxy for cost per flight and reusability, the prize maintained simplicity while guaranteeing an outcome that would offer a scalable and commercially viable breakthrough. As a result, the winning team rendered a product that was later applied to a commercial venture with Virgin Galactic airline, and they are now partners in the development of the world's first private space tourism enterprise.

Prizes must create financial leverage. For a prize to be successful, it should generate outside investment from competitors at an order of magnitude greater than the purse size. A prize needs to motivate investors so that teams have greater access to funding. Prizes work because they generate much greater interest and investment than the net value of the purse offered. Innovators and investors consistently overestimate their likelihood of succeeding, which provides fertile ground for attracting participation, experimentation, and innovation.

One of the great strengths of a highly publicized competition is the exposure that the prize brings to competing teams. In many instances, the purse is only one part of the value proposition that attracts competitors. The recently launched Google Lunar X PRIZE offers a total purse of $30 million, which includes a first-place award of $20 million. The winner must soft land on the moon, rove for 500

meters, and send a package of data back to earth. Although the purse is a fraction of the cost of achieving the targeted outcome, teams are actively registered and competing, and they are attracting investors and partners that they would not ordinarily reach if it was not for the exposure provided by the prize.

For prize designers, attracting competitors by offering them access to potential investors is an emerging way to distinguish a competition. Because the success of competing teams signals the success of a competition, prize managers should work closely with teams to maximize their chances of attracting capital and improving their likelihood of success.

THE FUTURE OF PRIZES

As prizes continue to gain popularity, we can expect to see growth across the landscape. We already are seeing prize purses well over $10 million. Whether or not these "mega-prizes" will continue to grow and command attention is uncertain, but as more of them are announced, the anticipation of their outcome grows as well. For example, the Victory Project, recently launched by the Dewey Foundation, has announced a $1 billion prize for any of the following outcomes: (1) develop a cure for breast cancer or diabetes; (2) reduce greenhouse emissions from petroleum-powered automobiles by 95 percent without increasing the cost of a normal car more than 5 percent; and (3) design a 3,000-pound car that gets 150 miles per gallon of gasoline, using EPA standards without increasing the cost of a normal car more than 10 percent.[21] However, the Victory Project has not yet raised the $1 billion purse, and only a loose set of rules have been published. Throughout the history of prizes, bold announcements of large cash purses have remained a driving force, but today even the most audacious launch is swallowed by the news media and then lost in the cycle. Prizes, even those offering the largest purses, must find a way to remain relevant. Fortunately, those prizes that are successful in drawing real competitors, attempting real solutions, and achieving real results offer rich and compelling content. And, as more prizes are successful in delivering that content to the media and the public, the distinction between a bold announcement and the narrative arc generated by a substantial prize will become increasingly apparent.

At the same time, there is tremendous growth among prizes offering smaller purses. Using the power of the Internet and a new generation of social networking tools, web-based prize portals are launching regularly and they are tapping into communities that are already prone to ideation and collaboration. The notion of drawing from the "wisdom of the crowd" has proven highly effective in developing such tools as Wikipedia and other important recent innovations. And, as communities on the web share a growing understanding of this power and the tools necessary to adopt it, smaller and more agile prizes are capitalizing on their readiness to play. The recent success of the Robert Wood Johnson Foundation and HopeLab through the website Ruckus Nation has proven that a highly automated Internet platform can produce such interesting prize outcomes as a product to "increase

physical activity in kids and help address the devastating effects of obesity."[22] If the future of prizes is recognized with each revolutionary breakthrough, then the future of prize tools will likely emerge from smaller breakthroughs that are born from many of these more automated platforms.

Another new frontier in the evolution of prizes is an attempt to break away from the notion that prizes are only effective for technological breakthroughs. Many prize designers are attempting to develop new models that will lead to behavioral changes and new social paradigms. Can we develop prizes that will have an impact on addictions without having to deliver a vaccine or some technological inoculation? Can we develop prizes to stem our dependence on environmentally damaging products, even when the alternatives are no more economically compelling? What can prizes do to offer a collective call to action for the world's most pressing social problems? These are only some of the questions that prize designers are attempting to address.

Fortunately, we are now seeing an emergence of academics and institutional interests leading prize design and tracking prize outcomes. The recently formed X PRIZE Lab at the Massachusetts Institute of Technology (MIT), led by Dr. Erika Wagner, is an example of the growing concern. Working with the MIT Sloan School of Management and the collaborative partnership of the Harvard-MIT Health Sciences and Technology program, leading scientists, including engineers and doctors, are focusing on the power of prizes.

While some successes have generated important momentum behind the resurgence of prizes, the level of experimentation remains high. Therefore, the likelihood of some failures is high as well. Fortunately, with each new variant we are learning more about the power of the model, offering fertile ground for innovation. New and adaptive prize types are surfacing, and there is still much to be learned. Whether or not prizes remain a permanent part of the tool kit used by philanthropists and corporate interests remains an unanswered question, but few would ignore the increasing need to find tools that offer as much leverage and deliver as much compelling content. If prizes are capable of producing breakthrough innovations, as they have done historically and recently, then we can likely anticipate even more attention and experimentation and even greater shared understanding of the power of prizes.

---

1. Charles A. Lindbergh, *The Spirit of St. Louis.* New York: Scribner Press, 1953. (Pulitzer Prize, 1954).
2. "On May 22nd, 1919, Raymond Orteig, of New York City, offered a prize of twenty-five thousand dollars 'to be awarded to the first aviator who shall cross the Atlantic in a land or water aircraft (heavier-than-air) from Paris or the shores of France to New York, or from New York to Paris or the shores of France, without stop.' After June 1, 1925, it was stipulated that the flight be made under the rules of the National Aeronautic Association of the United States of America, and the Federation Aeronautique Internationale of Paris, France." Lindbergh, *The Spirit of St. Louis*, p. 530.
3. See Knowledge Ecology International, Research Note 2008:1 (http://www.keionline.org/misc-docs/research_notes/kei_rn_2008_1.pdf) for a comprehensive cataloguing of historic and current prizes.
4. Of the 26 teams registered to compete for the prize, about one-third were new startups formed

specifically to go after the prize; another third were already formed and working toward space flight; and the final third were organized to accomplish other goals but redirected their efforts toward winning the prize. Engaging groups that had been working in other fields was an important component of successfully managing the prize effort.

5. These figures were taken from interviews with Dr. Peter Diamandis, founder of the X PRIZE Foundation. For a published account, please refer to Stanford Graduate School of Business, Case Study SI-90 (12/14/2006).
6. Robin Hanson, *Patterns of Patronage: Why Grants Won Over Prizes in Science,* Berkeley: University of California Press, 1998.
7. See www.ideacrossing.com.
8. See www.innocentive.com.
9. See http://www.moibrahimfoundation.org/the-prize.asp.
10. See http://www.africanmonitor.org/node/98.
11. Rick Weiss, "GMU Teacher's Ingenuity Nets $1 Million Prize." *Washington Post*, February 2, 2007, p. B1.
12. See www.apsanet.org/content_42621.cfm.
13. See http://money.cnn.com/2006/11/20/magazines/business2/crowdcasting_whatworks.biz2/index.htm.
14. See http://query.nytimes.com/gst/fullpage.html?sec=health&res=9D0DE3D81738F937A35751C1A967948260.
15. Like the Armand Hammer prize for a cancer cure, the recently announced prize from the Dewey Foundation for multiple cures in diseases such as breast cancer or diabetes is an example of a prize that has offered a significant purse ($1 billion) but that has not yielded a single meaningful competitor (see http://www.deweyfoundation.org/home.html).
16. See http://www.prize4life.org/page/about_us.
17. See Dava Sobel, *Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time,* New York: Walker and Company, 1995.
18. Karim R. Lakhani, Lars Bo Jeppesen, Peter A. Lohse, and Jill A. Panetta, *The Value of Openness in Scientific Problem Solving,* Watertown, Mass: Harvard Business School Working Knowledge, Feb. 7, 2007.
19. Ibid., p. 12.
20. Don Tapscott and Anthony D. Williams, *Wikinomics: How Mass Collaboration Changes Everything*, New York: Portfolio, 2006
21. See http://www.deweyfoundation.org/home.html.
22. See http://www.hopelab.org/innovative-solutions/ruckus-nation/.