

Innovation Tournaments:
Creating and Selecting Exceptional Opportunities

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Introduction

Innovation can make fortunes. A robust return on equity for a large firm is 20 percent per year. Contrast this with the returns for these innovations:

- Zocor, Merck's cholesterol drug, has contributed gross profits of well over \$10 billion on an investment of about \$500 million¹.
- Apple sold more than 100 million iPod portable music players in just the first six years after the portable music player's 2001 introduction. The iPod and the online iTunes store have generated over \$30 billion in revenue for Apple. Remarkably, Apple spends a *lower* percentage of revenue on research and development than most of its competitors².
- The movie *Harry Potter and the Sorcerer's Stone* had a budget of about \$125 million. Five years after launch, it had created over \$1 billion in revenues for Warner Brothers Studios. The creator of the Harry Potter saga, author J.K. Rowling, has seen an even greater payoff. She has become a billionaire thanks to books, movies, and merchandise based on Harry's adventures.

Harry Potter and the Sorcerer's Stone brought Warner Brothers Studios in excess of \$1 billion. How did other Warner Brothers movies launched during the same period fare? Remember *Chasing Liberty* or *The Big Bounce*? Or how about *Exorcist: The Beginning*? If not, don't worry, you aren't alone. Few people saw them, and the studio made little if any money on those projects. Moreover, when Warner Brothers made *Harry Potter*, it also analyzed thousands of other pitches for movies, developed hundreds of scripts, and seriously considered launching another dozen or so movies. Few of them made it to the box office, much less made money.

For Warner Brothers, or any studio, phenomenal successes like *Harry Potter* are the exception. But for a successful innovator, *exceptions* are the goal. In this book, we aim to guide you through the intelligent management of the creation, selection, and development of exceptional opportunities for innovation.

In the game of innovation, no bet comes with a guarantee. But that doesn't mean you can't become a better player. Recently two Serbians and a Hungarian won \$2 million from the Ritz Casino in London³. Luck? Robbery? Or simply smart betting? Perhaps all three. They allegedly used a laser embedded in a mobile phone to scan the velocity of the ball when the croupier released it and sent this data to a remote location. Based on historical data on a given croupier and a simulation model of the physics of the ball, a computer recommended bets. Could this approach perfectly forecast the outcome? No, but it could improve the odds from the traditional 37:1 to 6:1. In other words, by making use of historical data, professional methods, and a clever process, a fool's game became a profitable business. Minus the chicanery, this is the logic underlying this book. Innovation will always remain risky. Many projects will fail, and most opportunities won't warrant substantial investment. However, by following the tools, principles, and methods in this book, you can shift the odds in your favor.

What We Mean by Innovation

We define *innovation* broadly as a *new match between a need and a solution*. The novelty can be in the solution or the need—or in a new marriage of an existing need and an existing solution. Zocor was a new solution coming out of Merck's research labs that addressed the existing need to protect against heart disease. The recent introduction of the Smart car in the

United States by the German automotive company Daimler corresponds to an existing solution (the vehicle was introduced in Germany in 1997) to the newly emerging need for fuel-efficient vehicles in a country where gasoline was historically very inexpensive. The iPod was a new match between an existing need and an existing solution. The first iPod used disk drive technology very similar to what was inside most notebook computers at the time, and addressed the existing need for the portable storage and playback of digital music, a need that was previously addressed by MP3 players using flash memory⁴.


This definition of innovation encompasses hardware, software, services, and processes as well as needs that are exhibited anywhere, whether in a factory, a consumer marketplace, or the public arena. A new way to reduce heat loss in an office building to improve its energy efficiency could be an innovation and so could be the redesign of a manufacturing process to utilize a new automation technology. Thus, innovation need not always lead to new products or new lines of business.

In addition to achieving a new match between a need and a solution, *successful* innovation creates value. In most commercial settings, this means that the innovation results in financial profits, but alternative notions of value such as social welfare or environmental protection may motivate innovation in other settings.

Opportunities beget innovations

We define an *opportunity* as the seed that might later grow into an innovation. An opportunity is an innovation in embryonic form, a newly sensed need, a newly discovered technology or a rough match between a need and a possible solution. At this early stage of development, uncertainty clouds future value, so an opportunity can be thought of as a *hypothesis* about how value can be created. For a pharmaceutical company like Merck, an opportunity might be a new chemical compound that appears to control blood sugar. For a consumer-products company like Procter & Gamble, it might be a new cleaner suggested by a customer. Or for a materials company like 3M, it might be a new polymer with unusual properties. Some opportunities ultimately become innovations while others might never warrant substantial development.

Four examples of opportunities appear in the following exhibits. The first (Figure 0-1) is the creation of an email or text-messaging system to remind you to pamper and praise your spouse, while also providing suggestions on how to do this. The second is a do-it-yourself wireless doorbell (Figure 0-2). The third (Figure 0-3) is the script summary for a new movie, and the last one (Figure 0-4) is an opportunity based on recent nanotechnology research. Note that, in all four cases, the creator could describe the opportunity on a single slide, sometimes by combining text and graphics.



www.cambrianhouse.com

Submitted by: TechGuy
Date: Aug 10, 2006, 1:08 am

Spoil My Spouse

The Idea:
This idea comes from the simple fact that men are insensitive and don't remember to do nice things for their wife to show that they care (and women can always do better too). When you join Spoil My Spouse you will be subscribed to daily/weekly/monthly emails or SMS that give you an idea of something you can do to make your spouse happy. Such as bring her flowers, go home from work early, spend less time on Cambrian House, etc. The ideas would be crowdsourced and run through its own IdeaWarz to make sure they are quality. An idea like buy your wife flowers would of course be sent with an ad to send flowers. Birthdays, Anniversary, Mother's Day, etc could all be added with special email reminders sent out before and on those days (with more targeted advertising). Later this could be expanded to remind bosses, friends, etc of things they could/should be doing.

I thought of this idea when I was...
I try my best to do nice things for my wife, but I could always use new ideas or suggestions on what else I could do. Not to mention reminders to keep doing it.
Plus, who wouldn't want their spouse getting an email reminder of something nice they could do for their spouse?

Figure 0-1: An opportunity articulated via the web-based innovation network Cambrian House. (Source: The Cambrian House, <http://www.cambrianhouse.com>.)

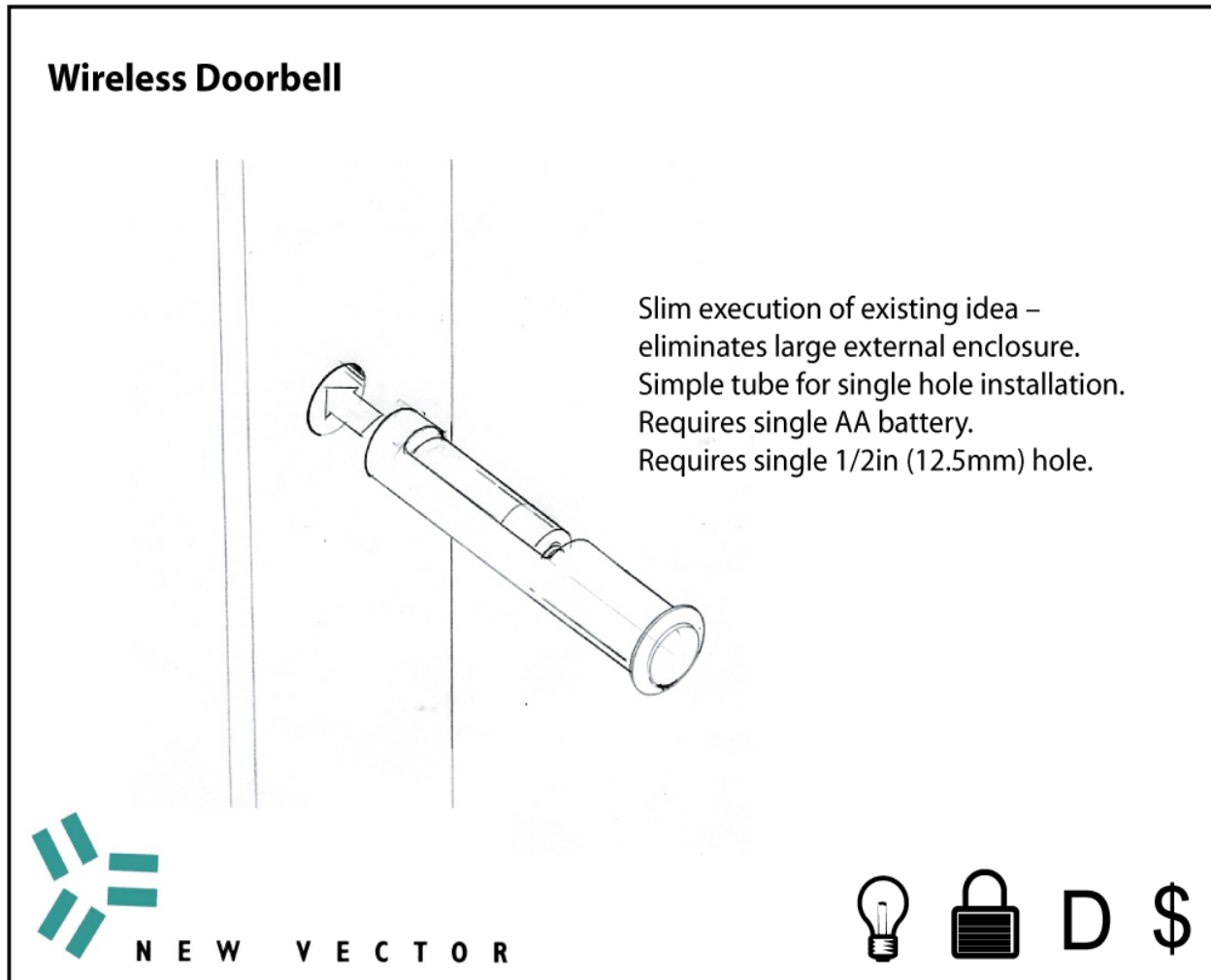


Figure 0-2: An opportunity a do-it-yourself wireless doorbell. The icons in the lower right refer to the firm's assessment of the opportunity relative to four criteria: its novelty, patentability, development risk, and gross margin potential. (Source: New Vector.)

“Deadly Greed”

Screenplay by Robert C. Johnson
October 2006

Screenplay Elements:

Movie of the Week (MOW) or Feature Film / Humor / Romance / Environmental Theme / Dog / Suspense / New York / Idaho / Family Movie / Black Screenplays

Synopsis:

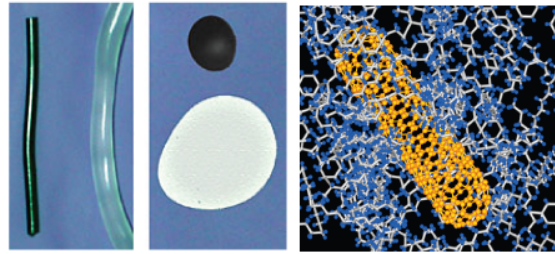
A NY tycoon and his wife are murdered. Their son, Jeff, a drunken loser and new CEO is stressed to the max by corporate murders and betrayal. He and a stray mutt hit the road in a ratty pickup truck and he hides his identity as a logger for a company he owns in a small Idaho town. Jeff discovers the corrupt company's interested only in forest clear-cutting for huge profits and rules over the workers and distrustful community. Corporate NY murders continue, and a hit man takes his best shot at eliminating Jeff. But new-found love, a disabled boy's courage and a dog's devotion and sacrifice save Jeff from himself and the enemy within.

Figure 0-3: An opportunity for a movie, articulated as a script synopsis. (Source: Robert C. Johnson.)

Carbon Nanotubes for Eliminating Die Swell

NIST research in *Nature Materials*, August 2004

Researchers at the National Institute of Standards and Technology (NIST) have discovered that the addition of carbon nanotubes to a common commercial polymer, polypropylene, leads to



dramatic changes in how the molten polymer flows. This process eliminates a widespread manufacturing headache known as “die-swell” in which polymers swell in undesirable directions when passing through the exit port of an extruder.

Researchers have been adding small amounts of nanotubes—tiny tubes of carbon about 1,000 times thinner than a human hair—to polypropylene in hopes of dramatically enhancing the material’s strength and other properties. Once realized, this enhanced polymer could be processed at high speed through extruders for use in manufacturing.

NIST materials scientists were concerned that because nanotubes make the polypropylene rubbery, the material would be difficult to process or its enhanced properties would be lost. To their surprise, the opposite proved true. When sheared (forced) between two plates, the polymer normally separates the plates. However, when nanotubes are added, the plates are pulled together. The scientists discovered that this “pulling-together” completely alleviated die-swell. Industry currently uses various time-consuming trial-and-error solutions to deal with the problem. Eliminating die-swell should help manufacturers improve their time-to-market by simplifying their die design processes and enabling the controlled manufacture of smaller components.

Figure 0-4: An opportunity in the form of a new result from a U.S. government laboratory (NIST). (Source: NIST.)

Spending More is Not the Key to Successful Innovation

Recently the *Financial Times* ranked the 50 most innovative companies using R&D spending as its measure of innovativeness (Figure 0-5). According to its scorecard, the more a company spent, the more innovative it was. The fact that Ford, General Motors, and DaimlerChrysler made it into the top four of the ranking must have left the editors puzzled.

You most likely will agree that one should not measure the innovativeness of a company by only looking at how much it spends on R&D. How about looking at the financial returns that are generated by the R&D investment?

Global Top Companies by R&D

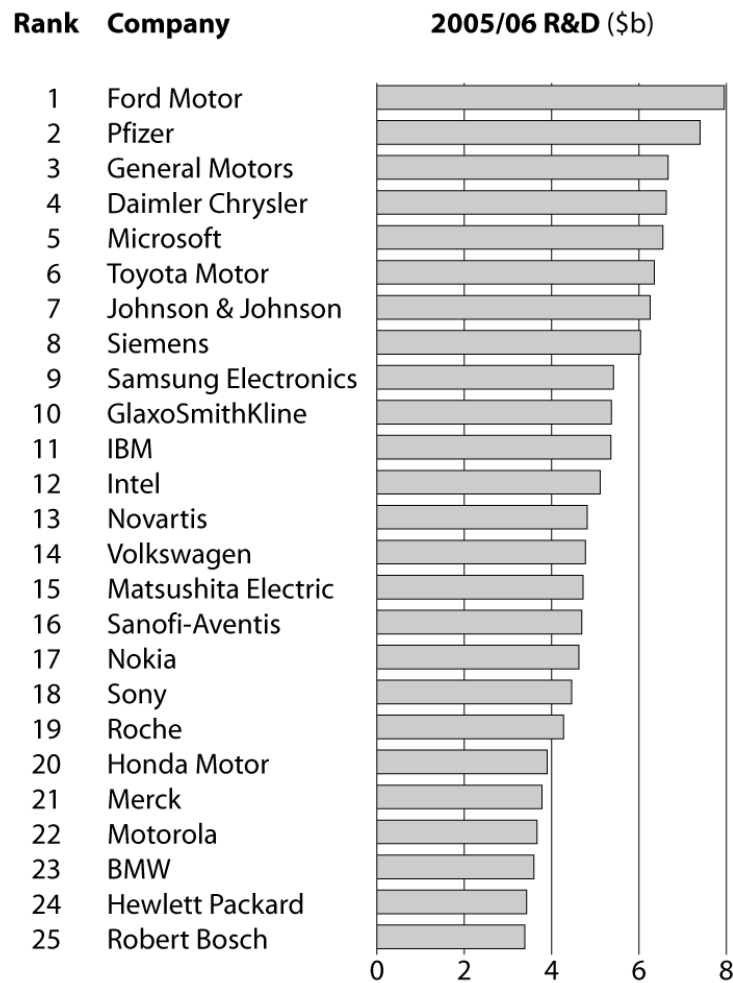


Figure 0-5: The Financial Times R&D scorecard was derived from data from the UK Department of Business, Enterprise, and Regulatory Reform (DBERR).¹

Do companies that spend more on innovation in the form of R&D outlays perform better financially? Consider the data in Figure 0-6, based on an analysis of R&D spending in the computer industry⁵. In the graph, the horizontal axis shows R&D spending over a five-year period as a percentage of revenue, and the vertical axis shows the firms' average growth rate for the five-year period beginning five years later. Some companies achieved little growth with scant investment in R&D. No surprise there. Others spent more on R&D and grew faster. No surprise there, either. The riddles include Apple, which achieved the fastest growth with below-average R&D investment, and Sun, which showed no growth at all, despite substantial R&D investments. This pattern is by no means unique to the computer industry. Many chemical, pharmaceutical,

¹ The initial study was done by the UK department of Trade and Industry. Department for Business, Enterprise, and Regulatory Reform, "The top global companies by R&D, growth and R&D intensity," DBERR Website, http://www.innovation.gov.uk/rd_scoreboard/world_global.asp, accessed July 2007. The exhibit shows just the top 25 of the 50 firms.

and automotive companies spend vast sums on innovation, yet do not seem to achieve higher growth or better margins⁶.

Based on the lack of a clear link between spending and performance, academics, consultants, and executives have questioned whether investments in innovation create value⁷. The absence of an obvious connection between spending and financial returns suggests that you cannot improve your financial performance by blindly increasing your investment in innovation. But it does not imply that investments in innovation can not be profitable. As we mentioned previously, the iPod has generated over \$30 billion in revenue for Apple, and substantial profits. Unlike many innovations introduced by Apple's competitors, the iPod was created with relatively little investment. The iPod neither required a lot of R&D spending (it used an existing technology) nor did it require a lot of spending to educate consumers (it served an existing need). A key to Apple's success was that it focused its investment on an opportunity with exceptional profit potential. In the balance of this chapter, we relate exceptional opportunities to financial performance using a tool we call the return curve, and then we show how *innovation tournaments*, the central framework for this book, are used to find such opportunities.

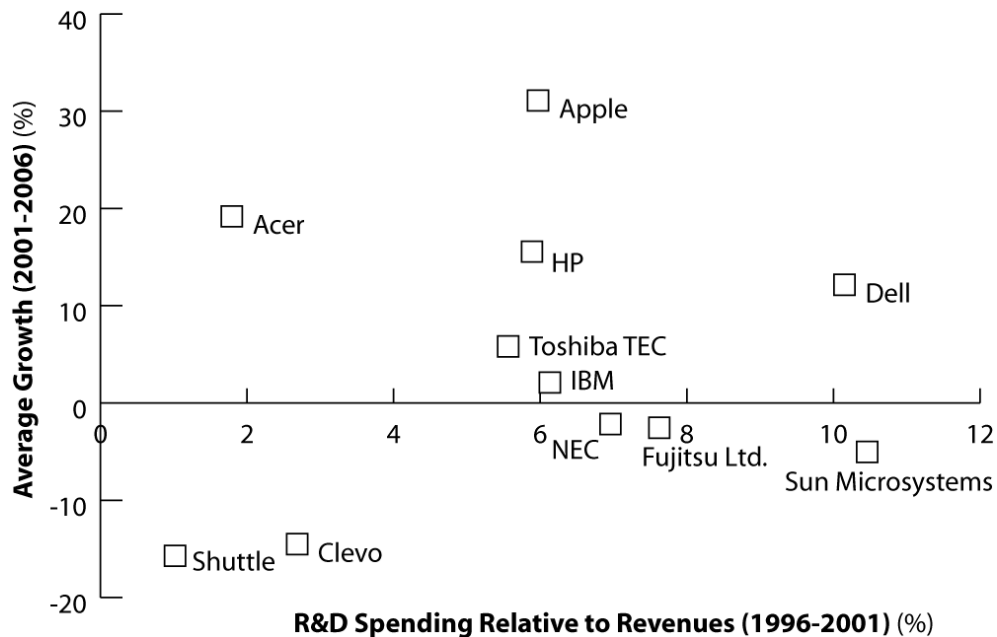


Figure 0-6: The relationship between R&D spending as a percentage of revenues and revenue growth five years later. Source: authors' research based on Wharton Research Data Services (WRDS) data.

The Innovation Return Curve

Underlying the analysis in Figure 0-6 is a simplistic view of innovation that treats innovation like a black box. You pour money in at one end and hope that more of it gushes out on the other. This approach assumes that increased innovation spending benefits all organizations, without accounting for the specific opportunities that would benefit from

additional investment. The fallacy in this assumption is revealed by looking at the reality of the investment decisions faced by most organizations.

Most opportunities exhibit a similar financial profile—you invest money now with the hope that you will receive more money later. Consider these seven opportunities, listed in Table 0-1, under consideration for investment.

| Opportunity | A | B | C | D | E |
|----------------|--------------------------------|---|--------------------------------|--------------------------------------|--|
| | Required Investment (\$ mm) | Expected Profit Contribution (\$ mm) | Profitability Index (= B/A) | Net Profit Contribution (= B – A) | Cumulative Profit Contribution (= sum of D's) |
| 1 Redhook | 5 | 53 | 10.6 | 48 | 48 |
| 2 Chocorua | 3 | 22 | 7.3 | 19 | 67 |
| 3 South Street | 22 | 90 | 4.1 | 68 | 135 |
| 4 Myth Buster | 11 | 22 | 2.0 | 11 | 146 |
| 5 Carlos | 5 | 7 | 1.4 | 2 | 147 |
| 6 Muriel | 14 | 14 | 1.0 | 0 | 147 |
| 7 Idaho | 9 | 8 | 0.9 | -1 | 146 |

Table 0-1: Seven hypothetical opportunities for investment.

For each opportunity listed, values are estimated for the required investment (A) and expected profit contribution (B). A profitability index (C) is calculated simply as the ratio of profit contribution to required investment (B/A). The net profit contribution (D) is simply the expected profit contribution less the required investment (B – A). The cumulative profit contribution (E) is the sum of the net profits contributed by the opportunities assuming they are pursued in the order listed.

We find it useful to represent this same information in a graphical form we call a *return curve* (Figure 0-7). Each opportunity is shown as a rectangle whose width represents the required investment and whose height represents the expected profitability index. These rectangles are placed from left to right in order of profitability. The area under the curve and above a profitability index of 1.0 represents the profits (above and beyond the cost of capital) that the firm expects to earn from these projects⁸.

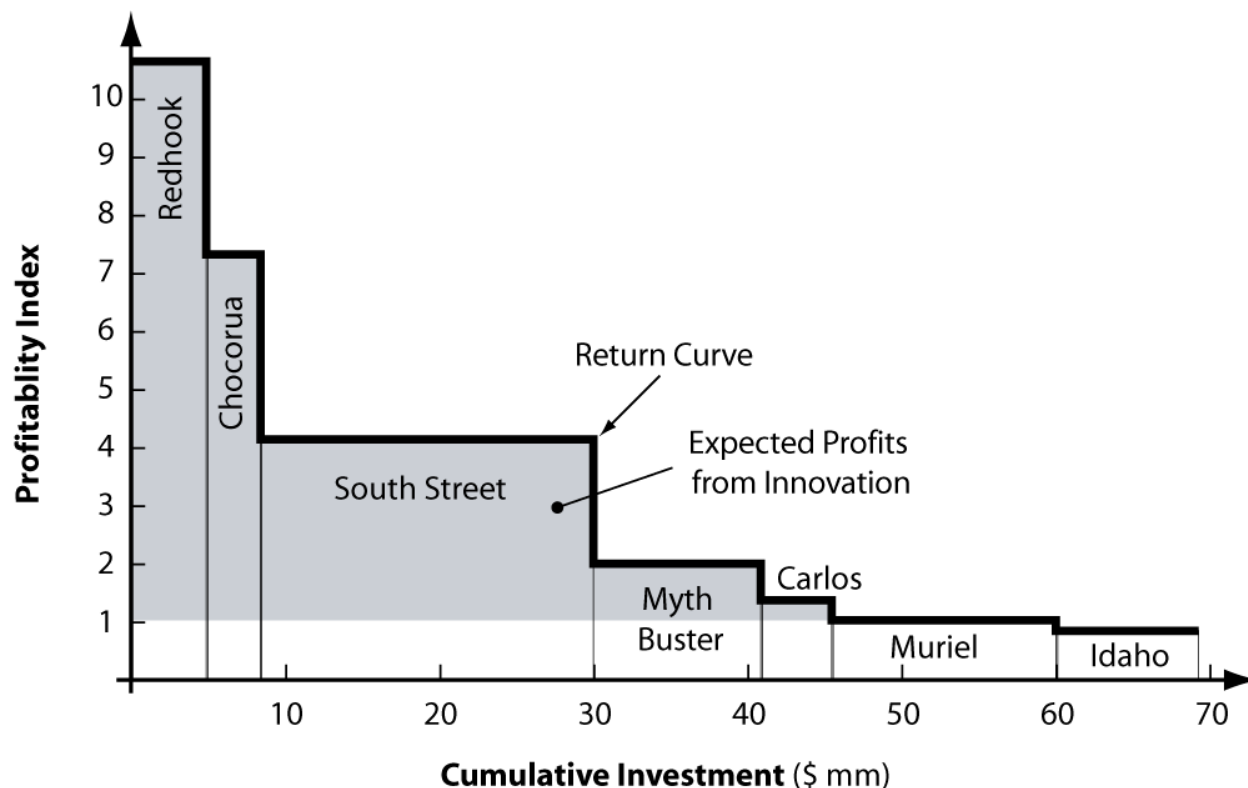


Figure 0-7: The return curve graphically represents the expected profits from a set of investments. Each opportunity for investment is shown as a rectangle whose width is the size of the required investment and whose height is its profitability.

Executives face tough choices around how much to invest in innovation and which opportunities to pursue. We suspect that executives studying these opportunities would devote the bulk of their time to Carlos, Muriel, and Idaho—that is, the marginal opportunities at the bottom of Table 0-1. Redhook, Chocorua, South Street, and Myth Buster promise such high pay-offs that they are “no-brainers” and can be moved forward with little discussion. Carlos, Muriel, and Idaho, in contrast, are the ones that require long meetings in which proponents make the weak case for funding. They eat up management attention during development, as they’re always teetering on the edge of termination.

The unfortunate reality is that managers focus too much of their attention on marginal opportunities and aim most of their sophisticated analytical tools at discerning subtleties in these opportunities. Exceptional opportunities—those that will account for the majority of profits—are not marginal; they are clearly superior. We believe that instead of obsessing over marginal opportunities, you’re better off considering how you can increase the supply of exceptional opportunities.

Exceptional opportunities drive exceptional value

While some individual innovations can have fantastic returns, simply spending more on innovation overall does not necessarily lead to increased profits. Consider the Time Warner example again. In any given year, the studio faces a certain number of movie projects. Some of them, like *Harry Potter*, are exceptional and offer amazing financial returns. However, such

projects are rare and a simple increase in investment is more likely to fund another *Chasing Liberty* or *The Big Bounce* than to deliver another *Harry Potter*.

The return curve provides an explanation for why increased spending levels typically don't lead to increased financial performance. If all you do is increase the budget that you have available for funding innovation opportunities, you increase the number of marginal opportunities that you fund. In contrast, successful innovation is not as much about choosing an appropriate spending level as it is about shifting the innovation return curve to your advantage.

If the executives in our example could identify more exceptional opportunities, the outlook for the firm would change dramatically. Consider, for example, how the introduction of two more exceptional opportunities (call them A and B) might change the picture (Table 0-2 and Figure 0-8).

| | A | B | C | D | E |
|----------------------------|---------------------|------------------------------|---------------------|-------------------------|--------------------------------|
| Opportunity | Required Investment | Expected Profit Contribution | Profitability Index | Net Profit Contribution | Cumulative Profit Contribution |
| | (\$ millions) | (\$ millions) | (= B/A) | (= B – A) | (= sum of D's) |
| A Exceptional Opp A | 8 | 104 | 13.0 | 96 | 96 |
| 1 Redhook | 5 | 53 | 10.6 | 48 | 144 |
| B Exceptional Opp B | 4 | 40 | 10.0 | 36 | 180 |
| 2 Chocorua | 3 | 22 | 7.3 | 19 | 199 |
| 3 South Street | 22 | 90 | 4.1 | 68 | 267 |
| 4 Myth Buster | 11 | 22 | 2.0 | 11 | 278 |
| 5 Carlos | 5 | 7 | 1.4 | 2 | 279 |
| 6 Muriel | 14 | 14 | 1.0 | 0 | 279 |
| 7 Idaho | 9 | 8 | 0.9 | -1 | 278 |

Table 0-2: The original seven opportunities with the addition of two exceptional opportunities.

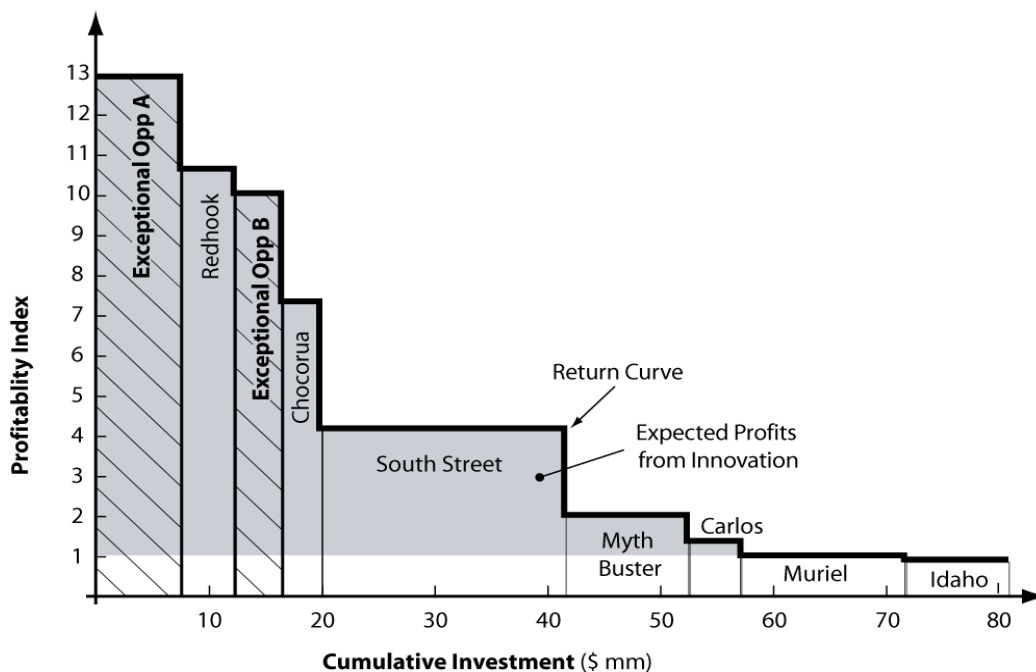


Figure 0-8: The return curve shifts dramatically with the creation of two new exceptional opportunities.

If the firm invested in the eight opportunities up to and including Muriel, it would earn cumulative profits of \$279 million, about doubling the profits over the base case. The shift in the return curves and the corresponding increase in profits is shown in Figure 0-9.

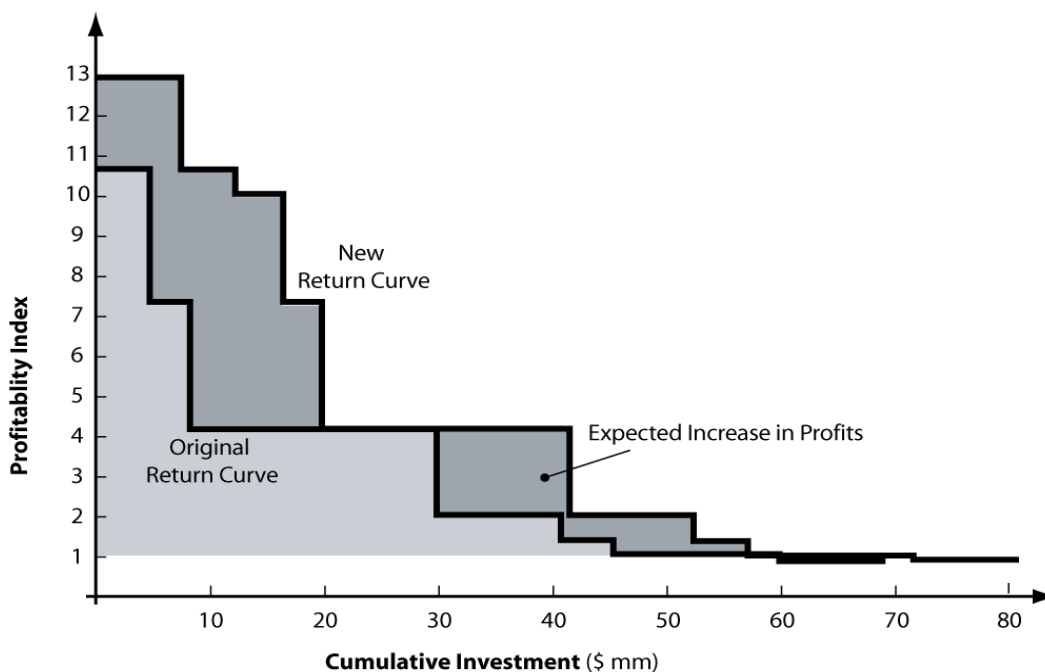


Figure 0-9: Comparing the original and new return curves illustrates the potential increase in profit expected as a result of the two new exceptional opportunities available to the firm.

Of course, adding hypothetical opportunities to the spreadsheet is easy. How can such exceptional opportunities be identified in practice and in a reliable and efficient manner? This is the central challenge we address in this book. We introduce the concept of innovation tournaments and explain how you can use innovation tournaments to create and select exceptional opportunities; opportunities that can significantly shift your innovation return curve.

Innovation Tournaments Identify Exceptional Opportunities

Creating opportunities is sometimes compared with lightning or flying sparks—spontaneous and uncontrollable⁹. While randomness and serendipity clearly underlie the fate of any particular opportunity, we believe that deliberate management of a system we call an *innovation tournament* can introduce professional rigor to the innovation process, the same rigor you likely apply in other parts of your business, whether financial budgeting or supply chain management.

At the most basic level, an innovation tournament is a competition among opportunities, embodying the Darwinian principle of the survival of the fittest. Before the value from an exceptional opportunity is realized, at its inception as a chemical cocktail in a Petri dish or a sketch on a napkin, it competes with many other opportunities to become one of the chosen few.

An innovation tournament, just like its counterpart in sports, usually consists of multiple rounds of competition. It begins with a large set of opportunities. A filtering process selects a subset to move to subsequent rounds and, from those, picks one or more champions.

For example, in its search for Zocor, Merck screened about 10,000 chemical compounds. Preclinical trials were started for more than a dozen of them, a handful were tested in humans, until the chemical compound simvastatin, which we now know as Zocor, emerged as the winner, beating the other candidate compounds in safety and efficacy.

Innovation tournaments characterize consumer product innovation as well. Figure 0-10 reflects the process used to find the handle for the Oral-B Cross-Action toothbrush. The exhibit shows the dozens of foam models that Oral-B's designers built and the five molded prototypes that it tested with consumers. Consumers liked the design shown in the middle of the photo best, and it enabled Oral-B to redefine the premium segment of the manual-toothbrush market.



Figure 0-10: The development of the Oral-B cross-action toothbrush involved the structured exploration of dozens of forms. Lunar Design's designers prototyped and tested five concepts (shown in center of image) before selecting the final design. (Source: Lunar Design.)

Whether organizing opportunities for pharmaceuticals or toothbrushes, all innovation tournaments have a similar structure, summarized in Figure 0-11. A large number of opportunities enter the tournament as contestants. A sequence of filtering steps (three in the case of Figure 0-11) eliminates most opportunities, leaving only the ones with the promise of exceptional value as survivors.

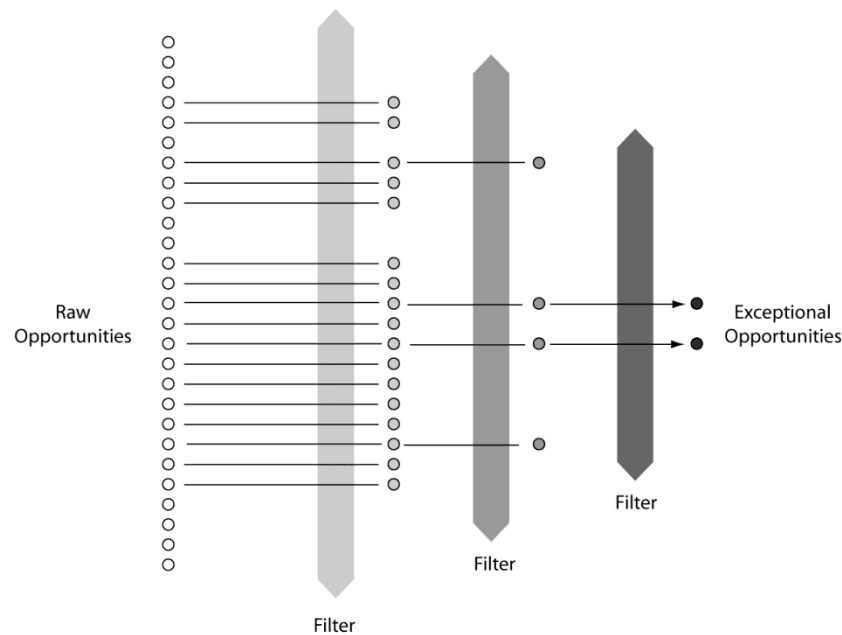


Figure 0-11: Tournaments begin with a relatively large number of “contestants” and apply filters in a series of rounds in order to identify “winners.” Effective innovation tournaments result in exceptional opportunities.

As you will learn in the coming chapters, several versions of this basic tournament design are common. For example, you might allow opportunities to mutate, to bounce back to a previous phase, or to spawn multiple variants. Yet, the fundamental logic of creation and filtering is common to all tournaments. Indeed, the central question of this book is not whether to use tournaments but rather how to manage them.

Roadmap to this Book

In Chapter 1, we develop the concept of the innovation tournament and illustrate the key variants of the tournament structure used in practice. We also identify the key levers on performance within the tournament structure.

In Chapter 2, we discuss tools and techniques that help you generate many more opportunities. We discuss ways to harness the power of individuals and groups in that quest. In Chapter 3, we show how to sense opportunities that arise outside of your organization, thus increasing the number of opportunities competing in your innovation tournaments.

In Chapter 4, we discuss the first elimination round in a tournament. At this stage, the challenge is primarily one of handling a large number of opportunities. You’ll screen for those

with the highest potential, and only the most promising opportunities will pass into the later rounds.

In Chapter 5, we explain how to align an organization's innovation tournaments with its business strategy, so that the opportunities you identify are more likely to address gaps in your innovation portfolio.

Innovation opportunities are worthless without intelligent filtering. In the second half of the book, we provide ways to improve your bets in each round of your tournaments. In Chapter 6, we explain how to analyze each opportunity in detail, using financial models of uncertain payoffs. In Chapter 7, we broaden the focus from individual opportunities to entire innovation portfolios and discuss how to deal with company growth expectations, resource constraints, interdependencies among opportunities, and diversification of risk. Then, in Chapter 8, we offer strategies for managing the cultivation and development of the most risky, but also potentially the most profitable, opportunities.

Once you have decided to implement an innovation tournament, you face a host of questions. How many filters should you impose? How quickly should you reduce the number of opportunities? How many raw opportunities should you consider in the first round? Chapter 9 guides you in designing the shape and size of a tournament to suit your business needs. Chapter 10 then discusses the organization of tournaments, suggesting different approaches for governance and administration. It also addresses when and how you should take advantage of ideas from outside of the organization.

We conclude with a chapter Getting Started, which helps you obtain some quick wins from applying innovation tournaments in your organization. We explain how to analyze your existing innovation process and help you set up your first innovation tournament.

Chapter Notes

¹ See <http://money.cnn.com/2006/01/30/news/companies/merck/index.htm> for Zocor revenue data; assumes lifecycle revenues and profit margins typical for the industry

² See <http://www.macworld.com/article/131874/2008/01/ipodsales.html> for sales data; R&D data and spending levels of Apple's competitors are based on authors' research

³ "Ritz Roulette £1.3m win scam," December 7, 2004, http://www.gamblinggates.com/news/casino/ritz_roulette_scam24041.html.

⁴ The iPod also relied on the iTunes desktop music management software, itself an existing technology developed previously by a small company.

⁵ This graph was inspired by a study of the Boston Consulting Group. James P. Andrew, "Innovation 2006," BCG Senior Management Survey (2006), The Boston Consulting Group, <http://www.bcg.com/publications>, accessed July 2007.

⁶ We conducted the same analysis for chemicals, pharmaceuticals, autos. No consistent relationship is evident between R&D spending and performance.

⁷ Terwiesch et al. provide one of the few empirical studies relating firm level R&D spending to financial performance. Christian Terwiesch, Christoph H. Loch, and Martin Niederkofler, "When Product Development Performance Makes a Difference: A Statistical Analysis in the Electronics Industry", *Journal of Product Innovation Management* Vol. 15, No. 1 (1998): 3-15.

⁸ All values shown are adjusted for the probability of success of the innovation. So, for example, a 50% chance of profits of \$80 million would be shown as an expected value of \$40 million. Furthermore, all figures are *present values*, accounting for the opportunity cost of the capital and the timing of the cash flows.

⁹ See, for example, G.C. O'Connor, R. Leifer, A.S. Paulson, and L.S. Peters, *Grabbing Lightning: Building a Capability for Breakthrough Innovation* (San Francisco: Jossey-Bass, 2008)

Tournaments 101

To illustrate the nuts and bolts of a tournament, consider the reality television show *American Idol*. One of the most popular shows on TV, it has attracted an audience of over 30 million people and has been replicated around the globe. Every season, it starts with a tour of a handful of American cities, where tens of thousands of wannabe stars audition in front of juries. Only about a hundred from each city get a second audition, this time in front of a larger jury. That group is then winnowed down to 40, who head to Hollywood. There, each performs a song from a given list and another of her choice and participates in various group performances. Finally, the best 24 contestants strut and sing weekly in the television series, where the audience votes for the best one.

A principal goal of the show is to entertain viewers, in part through the public humiliation that is typical in the early rounds. Nevertheless, the process is astounding in its ability to start with hoards of apparently undistinguished people and identify artists who go on to win Grammys and even an Academy Award¹.

American Idol resembles an innovation tournament: many contestants compete, but only the fittest survive. In this chapter, we explain innovation tournaments and show you how companies use them. We lay out the management levers available to improve your innovation tournaments and position tournaments within the larger context of innovation management and product development.

Four Examples of Innovation Tournaments

The professional services organization Deloitte conducts an annual innovation tournament. The objective of this tournament is to identify the innovative ideas occurring everyday at client sites or field operations, to bring them to the core of the organization for incubation and development, and then to deliver them back to the edge so more clients or personnel benefit from them. The tournament, which Deloitte refers to as Innovation Quest, also fosters an ongoing culture of innovation.

Deloitte's innovation tournament includes three phases: Ideation, Collaboration, and Evaluation. In the Ideation phase, all 43,000 employees of Deloitte are invited to submit ideas electronically. Innovation leaders and subject-matter experts from relevant disciplines within the organization review and select ideas to move to the next phase. In the Collaboration phase, idea owners build a team and solicit feedback on their ideas. Feedback is obtained from a diverse set of backgrounds that is available in the organization, leading to a significant enhancement of the initial proposals. During the final Evaluation phase, all Deloitte personnel are encouraged to provide their views on the most promising concepts – they vote for the best ideas – which is a significant factor in determining the winners.

To date, more than 1,000 ideas have been submitted to Deloitte's Innovation Quest, and more than 90 individual winners have been named. Winners received monetary rewards and gained exposure to senior leadership. Among the winning ideas was a new enterprise sustainability service, which allows clients to measure, improve, and sustain their social and environmental performance, and a new talent management suite, consisting of solutions designed to enhance an organization's ability to attract, develop, engage, and retain talent.

Just as Deloitte looks for innovations in professional services, Dow Chemical seeks them in its factories. For more than a decade, Dow has held an annual innovation tournament on how

to save energy and reduce waste. Factory staff, never going higher than the supervisor level, are encouraged to submit project ideas that pay for themselves within one year and cost under \$200,000 to implement. Submissions are peer reviewed and the most promising projects are implemented. Employees receive substantial cash prizes, and Dow reports triple digit returns from these improvement projects.² In fact, an audit of 575 projects that resulted from this tournament revealed average returns of 204 percent and an annual saving of \$110 million.

As a third example, consider Innocentive, a company that organizes innovation tournaments so that its customers, typically large technology-based companies, can overcome specific technical challenges. Innocentive publicizes a problem to a broad audience, including academics like us, experts like you, and anyone else who's interested. These people then submit their proposed solutions to Innocentive (typically along with some supporting scientific evidence), and Innocentive and its customer pick one or more winners. Winners get cash, while the customer surmounts its challenge.

Innovation tournaments also underlie the creative works of architects and designers, as our fourth example illustrates. Figure 1-1 shows the logo designs considered for TerraPass, a service that allows consumers to offset the carbon dioxide emissions from their autos, air travel and homes. The logo chosen by the company—at the far right in the graphic—has worked brilliantly. Yet it did not come about in a single creative flash. It beat out dozens of competing concepts, which company managers had created with the help of professional designers. The final logo was picked in an innovation tournament.

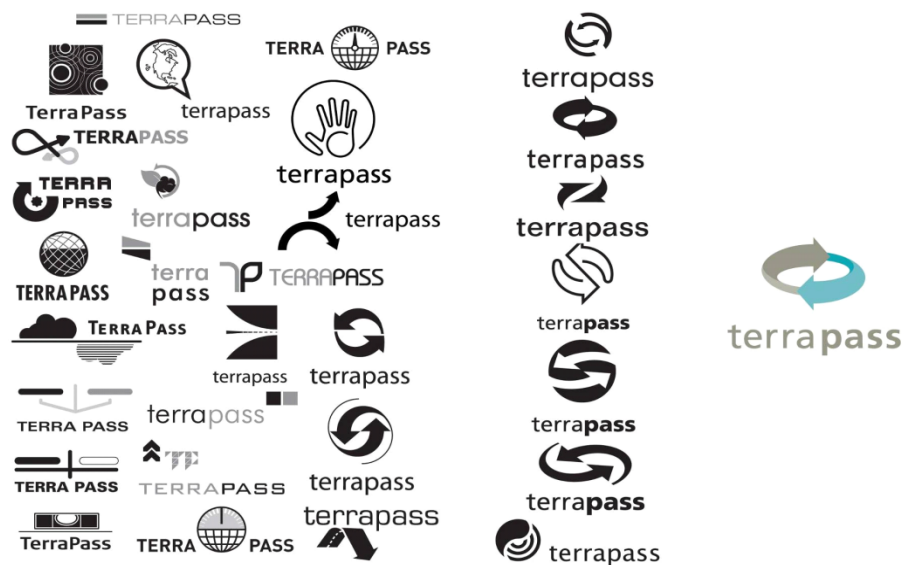


Figure 1-1: The innovation tournament leading to the TerraPass logo started with hundreds of concepts, of which about 23 were tested. Additional concepts were developed around the circulating-arrow theme in the first round of the tournament. Ultimately the design at the far right prevailed. (Source: Lunar Design and TerraPass.)

Distinguishing Attributes of Innovation Tournaments

New services for Deloitte, manufacturing improvements at Dow, solutions to scientific puzzles, or a new logo for a startup—regardless of the goal, the basic structure of an innovation tournament is always the same. All tournaments start with a set of contestants, which correspond to opportunities for innovation. And then opportunities are filtered to find the one (or the few) that are most likely to result in substantial value.

Beyond this common structure, however, innovation tournaments can exhibit significant differences. In the next section, we outline key attributes that characterize different types of tournaments.

Is the tournament open or closed?

Open tournaments are run in public, and anyone may enter. Open tournaments have driven innovation throughout history. In the 1700s, the British government offered awards for discoveries in navigation and the measurement of time. In the 1800s, the French Academy offered 100,000 Francs to the person who could produce soda from sea water. In the early 1900s, the Orteig prize offered \$25,000 for the first nonstop flight from New York to Paris. Nine teams competed, and Charles Lindbergh won by crossing the Atlantic in 1927 in his Spirit of St. Louis airplane. In the early 21st century, a Russian firm, Mojave Aerospace Ventures, received a \$10 million award from the X-Prize Foundation for flying its SpaceShipOne into the orbit with a budget a fraction of prior government-sponsored efforts. And, most recently, U.S. presidential hopeful John McCain outlined plans to award \$300 million to the organization that can leapfrog current battery performance while simultaneously reducing production cost.

The organizer of an open tournament is often a public body like a government or nonprofit group, but, as Innocentive demonstrates, profit-seeking companies can serve that role, too.³⁴ The strength of open tournaments is that they attract a broad range of participants, leading to a large, diverse set of opportunities. Witness Lindbergh. Before his famed flight, the press of the day had characterized him as a daredevil and an amateur—a "flying fool" who was sure to die in his attempt. His single-engine/single-pilot strategy departed radically from the conventional thinking of the time, and thus a more orthodox aviator, sponsored by a government or a large company⁵ probably would not have tried it.

Most innovation tournaments operated by companies, however, are *closed*. Employees identify the opportunities, and the firm keeps the proceedings proprietary. Deloitte's Innovation Quest or Dow's tournament both operate this way.

Is the tournament a pure cascade or does it allow renewal and iteration?

Most athletic tournaments are pure *cascades* in which contestants are evaluated and either advance or are eliminated. Pharmaceutical companies usually conduct their tournaments as pure cascades. Each opportunity—in their case, newly discovered chemical compounds—either advances or is eliminated. Once eliminated, a compound does not get a second chance.

But a tournament can also be *iterative*, allowing the initial opportunities to spawn others or letting eliminated ones be improved and then re-enter in the competition. Notice how Deloitte uses the collaboration phase in its tournament to not just filter opportunities but also to enhance them. Similarly, the final version of the TerraPass logo was not a contestant in the first round of that tournament. It evolved from one of the initial ideas, which also used the theme of the two

intertwined arrows. The concept of iteration is illustrated in Figure 1-2 in the form of additional arrows (going from right to left) and additional opportunities that appear only after the first filter.

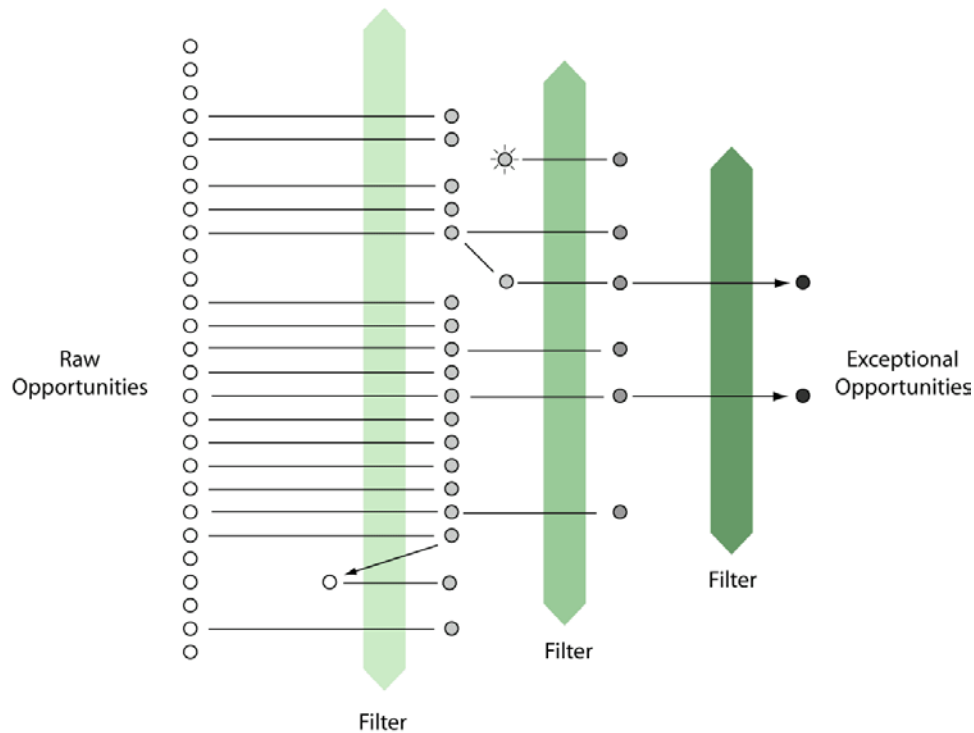


Figure 1-2: A tournament with renewal and iteration. A new opportunity is identified after the first filter, an opportunity is refined and reemerges as a first-round candidate, and an opportunity spawns two variants.

Does the tournament play out in one or multiple rounds?

The simplest tournament consists of one round, resembling a running race like the New York Marathon. Thousands of opportunities compete in the single round of evaluation, and the best prevail. Often, however, innovation tournaments consist of multiple rounds, resembling the playoff structure of sporting events such as Wimbledon in tennis or the World Cup in soccer. Multi-round tournaments quickly weed out the mediocre opportunities, making it possible to devote more time and resources to evaluating the most promising ones.

Remember the search by Oral-B's designers for a better toothbrush, which we described in the introduction of this book. The designers created about 100 sketches in round 1, dozens of foam models in round 2, and then tested just five plastic prototypes with consumers in round 3. Similarly, Deloitte uses two phases of evaluation and voting in the Innovation Quest.

Does the tournament employ absolute or relative filters?

A tournament can employ absolute or relative standards to judge opportunities. With an absolute standard, opportunities are evaluated against a fixed benchmark or threshold of quality. If an innovation clears the threshold, it advances. In contrast, a relative standard operates like a beauty contest: the best opportunity wins, not because of its absolute worth, but because it beats the other entries. To win the Orteig prize, Lingbergh had to meet an absolute standard. Had he

landed in Brest, on France's western coast, he would have flown further than any prior contestant but would not have met the criterion and received the money.

Similarly, the innovation tournaments at Deloitte and Dow seek opportunities that meet the absolute standard of promising profits. If in any given tournament, one of the companies identified multiple opportunities that seemed to meet that standard, it would most likely not restrict itself by funding just one.

In contrast, a tournament that seeks a novel design for a logo or a toothbrush is typically based on relative comparison. Even if the organizer finds several promising designs, it will only use one. Conversely, even if none of the designs inspires awe, the best of them may advance for further development.

Which innovation tournament is right for me?

Open or closed, cascading or iterative, one round or multiple rounds, absolute or relative comparisons. Which is right for you? And how do you run *your* tournament, ensuring that *your* opportunities are exceptional and create economic value? These questions are at the heart of this book. In answering them and related questions, we'll articulate a principle-based approach to the efficient creation, selection, and development of opportunities, the science of innovation tournaments.

The Power of Tournaments

At first glance, tournaments appear to be a wasteful way of innovating. They require you to invest time and money in generating many opportunities only to abandon most of them. If innovation were a manufacturing process, it would have horrible levels of defects. Indeed, tournaments are the *second best* way to innovate. A better approach is innovation based on rigorously tested scientific theories. If, for example, you had a scientific model that would let you create the perfect song for a particular market segment, including its rhythm, melody, and harmonies, your job as a music producer would be easier. You'd just crank up the computer and let it sing. In some fields, innovators have such models. Aircraft engineers at Boeing or Airbus don't need a tournament to find the size of the fuel tanks to supply an airplane intended to cross the Atlantic.

In practice, most innovation problems don't allow that sort of approach. Instead, aspiring innovators have to rely on a certain amount of trial-and-error exploration to find exceptional opportunities⁶. The lack of science is especially vexing for areas in which consumer tastes alone determine the fate of an innovation, as in the world of entertainment.

Think about movie production. Studios such as Pixar do not find blockbusters like *Cars* based on scientific theories. Several years before making the animated feature, the company considered about 500 pitches, each describing a potential movie (Figure 1-3). The storyline for *Cars* sprang from neither a random flash of inspiration nor an analytical process based on published theories of movie making and consumer preferences. Instead, it was the outcome of an innovation tournament.

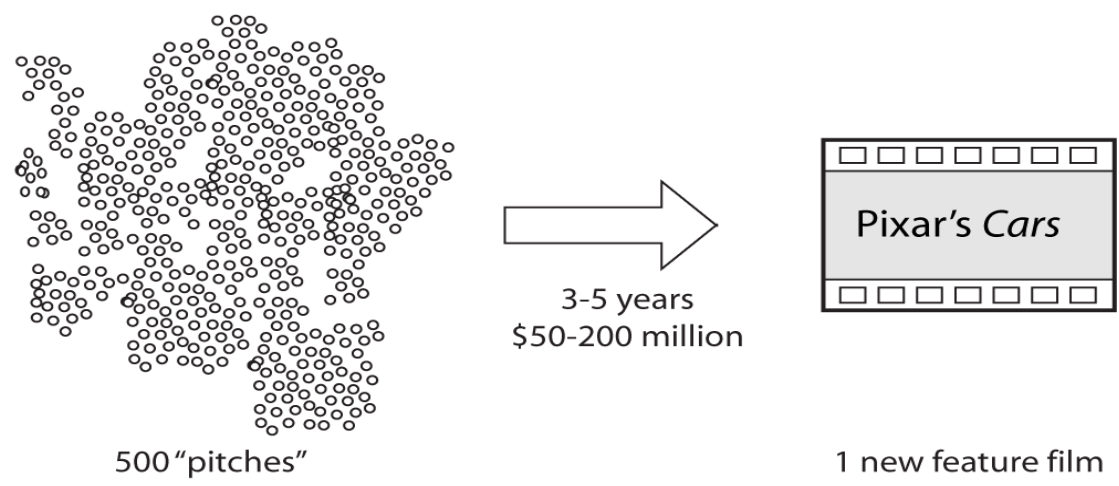


Figure 1-3. The feature film *Cars* arose from a tournament that began with about 500 candidate “pitches.”

For every individual opportunity you consider, whether molecule, movie pitch, or mousetrap, you face a range of possible outcomes and thus uncertainty in the payoffs of the opportunity. When you create opportunities, you essentially print lottery tickets. To use terminology from statistics, you create *draws from a payoff distribution*. There is little harm associated with a ticket that does not win; the *winning* tickets in your pocket are the only ones you care about. In innovation tournaments, these winning tickets are the exceptional opportunities that create the bulk of the financial value from innovation.

Figure 1-4 illustrates the opportunity creation process and the logic of seeking exceptional opportunities⁷. The process creates a stream of raw opportunities, which you filter for quality. Imagine the filter as a hurdle over which only the best opportunities must pass. The process will probably produce many middling opportunities for every exceptional one. We illustrate this variance in the quality of the created opportunities with a bell-shaped curve. Great ideas are scarce and lie out on the upper tail of the pay-off distribution.

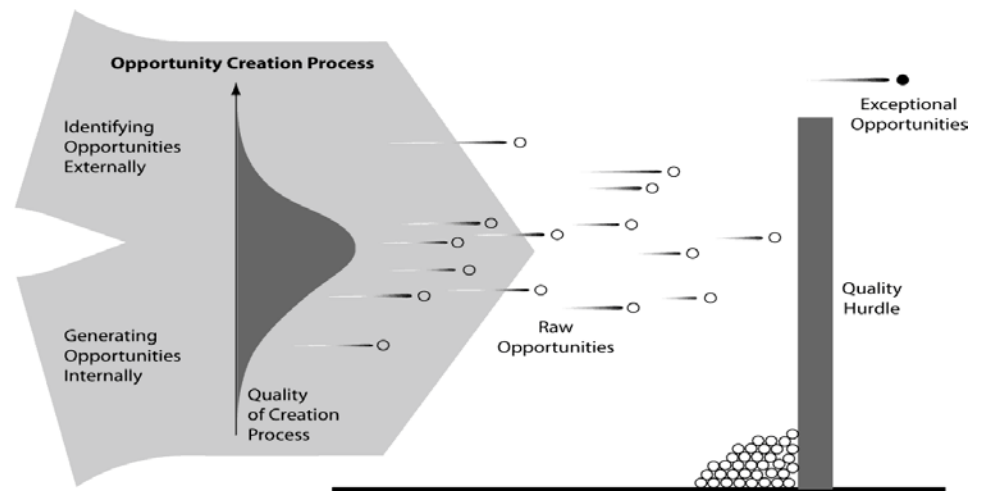


Figure 1-4: The opportunity creation process. The objective of the process is to find a few exceptional opportunities, not to produce consistently middling ones.

Given that the best opportunities are rare, how can you increase the supply of ones that clear your quality hurdle? How can you print more winning lottery tickets? There are three basic ways.

1. Increase the *average quality* of your opportunities. If you create better ones on average, more will clear the hurdle.
2. Increase the *quantity* of your opportunities. If you produce more opportunities, you'll see more exceptional ones. The logic here is simple: on average, if you find one 7-foot tall person per 100,000 people, you'll find two among 200,000. Creating more opportunities (without sacrificing their average quality) is thus a key lever in finding the exceptional few.
3. Increase the *variance in the quality* of your opportunities. This is a direct, though not immediately obvious, implication of statistics. Holding the average quality and number of opportunities constant, you'll generate more exceptional ones if your process exhibits *greater variability*; that is, if it's *less consistent* in the quality of its output. Variability contradicts normal approaches to process improvement, but it's exactly what you want in opportunity creation. Generating wacky ideas and wild notions increases the chance that at least one of your opportunities will be exceptional.

Not a Six-Sigma Process

Many business people have been trained to try to eliminate the variability, driving towards highly consistent, repeatable outputs. This is the logic of modern quality management, including the concepts of *process capability* and *Six Sigma*. It also happens to be exactly the wrong way to think about innovation.

If you managed a chain of pizzerias, you'd want each restaurant to produce 100 tasty, tempting pizzas a night, with little variation in quality. That's what makes for happy customers. This kind of performance would, however, be a terrible outcome for an opportunity creation process. You'd prefer to produce one truly exceptional opportunity and 99 lousy ones rather than 100 merely good ones. In innovation, you'll pursue only a few of the opportunities you create, and that handful of exceptional ones will create the value that you derive from innovation. As a pizzeria, the last thing you would want is an unpredictable chef. However, for the opportunity creation process, the less consistent the chef, the better.

Where Do Innovation Tournaments Fit in Your Business?

In the past two decades, most firms have structured the *product development* portion of their innovation efforts, often with a *phase-gate* process. These processes have clearly defined phases, usually four or five, with intermediate gates, essentially go/no-go reviews. With most phase-gate processes, the presumption is that the target opportunity, if addressed effectively, will result in a successful product or service. Most of what goes into a phase-gate process does eventually come out, and the fraction of projects killed during it is typically at most half.

The strength of the phase-gate processes is that it applies the structure and managerial rigor you are used to from production or sales to the development of new products and services. This activities upstream of the product development process, often labeled "the fuzzy front end", historically has been managed loosely (if at all) and often has been perceived as the work of creative geniuses.

A phase-gate process is not an innovation tournament. Phase gates work well at developing and advancing an opportunity after it is somewhat validated. Once you have identified a great business opportunity such as the iPod, the stage gate process will help you to develop it. But the stage gate process does not help you to identify the opportunity of a disk-drive based portable music collection in the first place.

The focus of this book is the sensing, screening, and evaluation that happens before development even begins. Just as the perfect production of a poorly designed product will lead to commercial failure, so will the perfect development of a bad innovation opportunity. The phase-gate process revolutionized product development in many companies by introducing structure and analysis. Now is the time to revolutionize the way you create and select opportunities. (See Figure 1-5.)

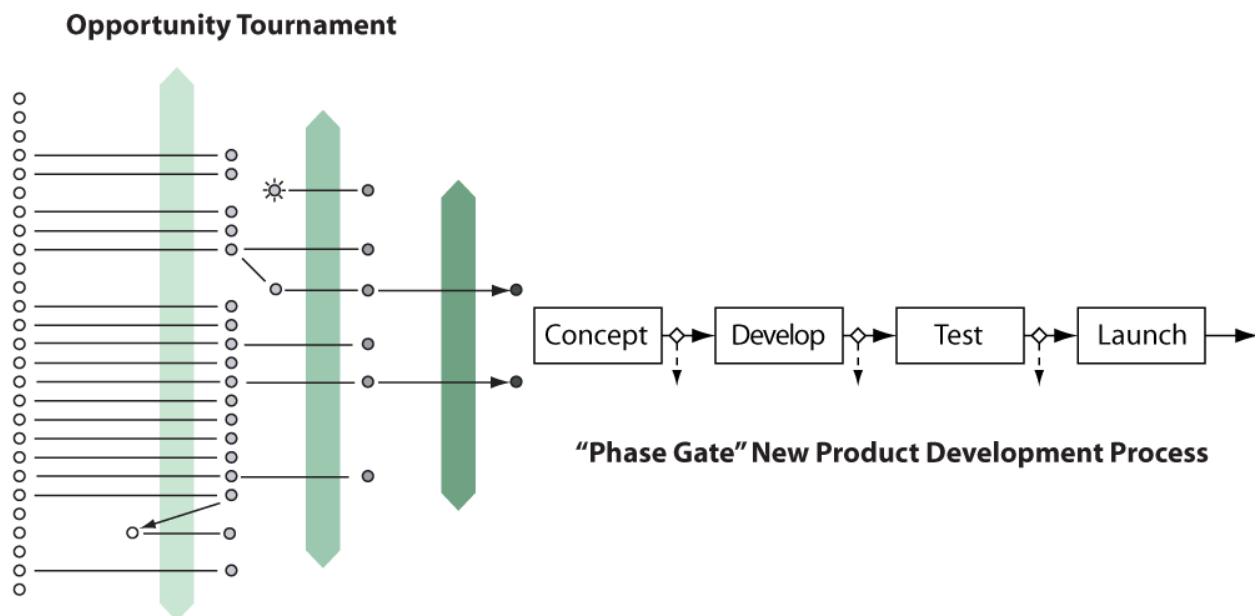


Figure 1-5: One way to think about the innovation process is as an opportunity tournament that precedes a phase-gate new product development process.

Other tournaments in business

Tournaments are a broad tool. You almost certainly run them in other areas of your business when, for example, searching for a new executive, a new product name, or a new enterprise software system. If you're like us, you might even use tournaments to determine what car to buy or where to spend your next vacation. A lot of the lessons in this book will translate to other tournaments you run.

We also readily acknowledge important aspects of innovation that go beyond the management of tournaments. For this reason, not everything in this book is restricted to tournaments.

Thus, this book is about innovation and it's about tournaments. Most of the book is about the use of tournaments in innovation, but some of the ideas about innovation are not unique to tournaments and some of the ideas about tournaments are not unique to innovation. We hope you can accommodate this looseness in these conceptual boundaries.

Chapter Summary

Tournaments propel innovation, whether the goal is Lindbergh's advance in aviation or Deloitte's refinement of its professional services. All tournaments start with many opportunities and filter them to identify the exceptional ones.

When running an innovation tournament, you must make a number of organizational decisions. Will your tournament be open or closed? Will it be a strict cascade or allow iteration? Will you have one round of elimination or multiple rounds? Will your quality standard be absolute or relative?

Three levers enable you to improve the quality of your best opportunity, that is, the winner(s) of your tournament. You can feed the tournament with a greater number of contestants. You can improve the average quality of your contestants. Or you can increase their variance in their quality.

Innovation tournaments provide a structured way to manage the fuzzy front-end of innovation. Not even the best product development process can create exceptional value if you feed it with a mediocre opportunity.

Diagnostics

Each of the ten chapters in this book concludes with a number of questions, which help you to apply the lessons of the chapters to the innovation challenges you face. Since this chapter provided an overview on the idea of innovation tournaments, we begin with broad questions, many of which will be the subjects of future chapters. Please pick an innovation challenge you recently faced and reflect on it.

- How many opportunities did you consider at the outset? Did you consider enough? What would have happened if you'd considered more?
- How did you identify your opportunities? In what way did they reflect your current business strategy? Did you identify them largely by looking inside your company or outside?
- How did you evaluate the opportunities financially? When in the tournament did you start using financial metrics? How did you incorporate risk into your assessments of value?
- How did you determine the stringency of your filters and the ratio of winners to losers at each phase of the tournament?
- How did you compare radical innovations with uncertain prospects to incremental innovations with relatively certain payoffs?

Chapter Notes

¹ Data about the American Idol show are taken from http://en.wikipedia.org/wiki/American_idol, accessed August 11, 2008.

² E. Von Weizsacker, A.B. Lovins, and L.H. Lovins, *Factor of Four: Doubling Wealth and Halving Resource Use* (London: Earthscan, 1997).

³ The theory underlying open innovation tournaments is explained in Terwiesch and Xu, “Innovation Contests”, *Management Science*, published online before print Jul 25, 2008 , DOI: doi:10.1287/mnsc.1080.0884

⁴ There are various ways to categorize the sources of innovation. See, for example, P. Drucker, “The Discipline of Innovation,” *Harvard Business Review* Vol. 76 (Nov/Dec 1998): 149-157.

⁵ See <http://www.xprize.org/about/the-x-prize-heritage>

⁶ Sommer and Loch have researched this issue extensively. See S.C. Sommer, and C.H. Loch, “Selectionism and Learning in Projects with Complexity and Unforeseeable Uncertainty,” *Management Science* Vol. 50 (October 2004):1334-1347. See also Fleming, Science as a Map in Technological Search.

⁷ This figure is inspired by the research of Dahan and Mendelson, who apply the statistical tools of extreme value theory to the area of innovation. For more details, see E. Dahan and H. Mendelson, “An Extreme Value Model of Concept Testing,” *Management Science* Vol. 47 (January 2001):102-116.

Generating Opportunities Internally

Most organizations generate about half of the opportunities in their innovation tournaments *internally* through the creative efforts of individuals and teams¹². This chapter focuses on generating more and better raw opportunities through the efforts of your people. As with many pursuits, you mostly improve at this by working hard. But while we don't know of easy ways to skirt the diligent application of effort, a handful of techniques can get you started and prevent you from getting stuck.

In this chapter, you will learn to:

- Apply a set of techniques to stimulate opportunity generation;
- Structure the front end of a tournament to capture ideas from members of your organization;
- Effectively harness the creative abilities of individuals and groups.

These techniques can be used by entrepreneurs seeking business ideas, an executive attempting to revitalize a product line or a task force exploring new business opportunities for an existing firm.

The approach of this chapter is largely to “push”—feed the innovation tournament with promising raw material and hope that some of the opportunities fit well with the strategic direction of the organization. However, when working within the context of an existing organization, a “pull” can also be exerted on the opportunity generation process. Chapter 5 is focused on pulling opportunities into the process based on your desired strategic direction.

Techniques for Stimulating Opportunity Generation

For some creative people there is nothing more fun than coming up with new ideas. However, we find that the majority of people have a hard time when asked simply to generate some promising opportunities. For them the problem of coming up with something new is simply too abstract, too unstructured, and has too many degrees of freedom. To stimulate the generation of many ideas from a diverse group of people, you must provide your employees, especially those struggling with the task, guidance in opportunity generation.

In the following pages, we suggest a collection of methods for generating opportunities. We will explain how you can internally create opportunities by looking for alternative approaches to existing innovations, following a personal passion, taking an annoyance-driven innovation approach, de-commoditizing a commodity, driving an innovation “down market,” being trend driven, creating new product attributes, and decomposing the functions of a business in a novel way. Several other authors, including Nalebuff and Ayres³ and Shane⁴, offer additional methods. The chapter notes and our website www.InnovationTournaments.com provide references to this stream of work as well as to web-based resources for facilitating idea generation.

1. Alternative approaches to existing innovations. When another firm innovates successfully and brings a new product or service to market, it in effect publishes the location of a gold mine. You can exploit this information by either considering alternative solutions that could address the same need or alternative needs that could be addressed with the same solution. Here's how. (1) Scan the media and monitor the marketing activities of other firms by, say, attending tradeshows. (2) Articulate the need and solution associated with any innovation that you identify.

(3) Generate alternative approaches to meeting the need or alternative needs that can be addressed with the new approach.

For innovations in many domains, you should scan *WIRED*, *Fast Company*, *Business 2.0*, *Inc.*, *The New York Times*, and *The Wall Street Journal*. Almost any issue of these publications will yield a handful of new innovations. Consider the excerpt from *Business 2.0* shown in Figure 2-1. The need is caffeine delivery (or, more fundamentally, increasing alertness). The solution is dissolvable film strips, originally used by Pfizer in Listerine PocketPaks. Other opportunities easily generated from the identified need include caffeine spray, caffeine jelly beans, and caffeine sweetener packs (mixed with Splenda perhaps). And other substances that dissolvable strips might be used to deliver include ibuprofen, antihistamine, vitamins, guess-the-flavor medicines, or fluoride.

Fresh Perked

Boots Caffeine Strips; \$2; www.boots.com

CHRIS TAYLOR
Senior editor,
Business 2.0

I remember how my British father, rushing to get ready for work, used to wish for a way to combine mouthwash and caffeine in one timesaving product. It took 25 years, but my father's dream has come true: Boots, the largest U.K. pharmacy chain, began selling these mint-flavored caffeine strips in late 2004. They're a lot like those Listerine breath-freshening strips—and taste just as bad. But the Boots variety also delivers a caffeine kick that's about equal to half a cup of coffee (28 strips come in a pack, but Boots recommends using no more than four a day). I use them whenever I want a java jolt without having to take a bathroom break half an hour later. The buzz is pretty much instantaneous. Now, whenever I visit the United Kingdom, I have an ever-growing group of friends and colleagues wanting me to bring back Boots strips for them. They're really cheap gifts and probably the biggest bang you can get for the weak dollar abroad.

TELL US ABOUT YOUR INDISPENSABLE TOOLS AT favorites@business2.com

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NUCCI STUDIO (CAFFEINE STRIPS)

Figure 2-1: Boots caffeine strips as described in *Business 2.0*. (Source: Adapted from *Business 2.0*. Photo courtesy of Nucci Studio.)

2. Follow a personal passion. Innovators who have the luxury of considering any field can benefit from plumbing their personal passions. It's easy. List your passions—endeavors that keep you awake with excitement—and then consider how emerging technologies, trends, and business models might influence them. Or identify unmet needs that you have in connection with the personal interest. An avid bicyclist whom we know has been developing a nutrient delivery system for use with existing hydration backpacks (for example, Camelbak), which has applications for the military and for a wide variety of sports. He identified the opportunity while reflecting on his desire to adjust the amount of sugar and electrolytes in the beverages in his pack.



Figure 2-2: Nutrient delivery system worn during testing by the inventor, Matt Kressy (nutrient pouch, tubing, and valve on his right side).

3. Annoyance-driven innovation. Successful innovators are often chronically dissatisfied with the world around them. They notice unmet needs of users, including themselves. Consider Tom Stemberg, founder of Staples, the office-supply company, and later Zoots, a dry-cleaning chain. Stemberg started both because of his frustrations with existing firms. When taking this approach, list every annoyance or frustration you encounter over a period of days or weeks and then pick the most universal and vexing ones and dream up solutions. Any problem is an opportunity. An annoyance faced as this paragraph is being written, for example, is that the cable television technician can only be scheduled for four-hour windows during the workweek. Who can wait around for half a day on a Wednesday for the cable technician? How about allowing anyone requiring service to accept or decline actual openings as they come available with, say, 30 minutes notice? The notice of an opening could be sent by text message to a cell phone, and all you would need to do is reply to the message to accept the opening. You may not find this particular solution compelling. Maybe you've already thought of a better one.

An annoyance that gives birth to the opportunity doesn't have to be yours alone. Instead, you might find it through customer complaints or market research. A powerful way to understand others' annoyances is to immerse yourself into the world of people using your products or services. In chapter 5, we will introduce consumer anthropology as a powerful method to find out first hand from your potential customers what they like about your products or services and what they are annoyed with.

4. "De-commoditize" a commodity. Often, price competition characterizes a product category, and the offerings themselves are little more than commodities. Recall coffee before Starbucks or breath mints before Altoids. A commodity like this creates an opportunity for innovation. To pursue this kind of innovation, list all of the inexpensive, undifferentiated products or services in a category and then consider the possibility of deluxe versions. Take all-

purpose wheat flour. It's often found on the bottom shelf of the supermarket. Most households use little of it except around holidays. The typical packaging, a paper bag, is messy. Why not sell flour in a re-sealable plastic container, which could be stored in the freezer to preserve freshness? Perhaps other baking supplies could be sold with compatible packaging. Consumers may be willing to pay a premium for a solution attuned to their needs. Thus, when you are de-commoditizing an existing product, you drive it "up-the market" with the goal of increasing the market.

5. Drive an innovation "down market." Just as you can drive products "up the market", you can drive products "down the market". Consider the example of four entrepreneurs with a history in the toy and candy businesses. They believed that their competitive advantage was in creating small, cheap battery-powered devices, as they had done with the *Spin Pop*, a lollipop spun by a little motor. To generate opportunities for a new venture in 1998, they trolled the aisles at Wal-Mart looking for expensive devices that they could make dramatically cheaper. They were struck by the array of electric toothbrushes, many selling for about \$100, yet none having much more complexity than their spinning lollipops. They decided to "create an electric toothbrush that can sell for six dollars." Their SpinBrush became the best selling toothbrush of any type in 2000, and they eventually sold their business to Procter & Gamble for about \$475 million⁵. To follow their example, list the premium products or services in a category and then imagine much cheaper versions that provide many of the same benefits.



Figure 2-3. A Braun electric toothbrush and the Crest Spinbrush. In the 1990s, electric toothbrushes like the Braun model sold for \$50-100. The target price for the Spinbrush was \$6.

Driving an innovation down market works well if a product or service is only available to industrial or commercial customers. In this case, you can “consumerize” the offering. Often, innovators introduce a product or service to needy, less-price-sensitive segment, typically commercial or industrial customers. The original innovator may lack the resources or interest to pursue a consumer version, giving rise to an opportunity.

You can explore these sorts of opportunities by pondering a product or service normally provided only to industrial, professional, or commercial markets and then envisioning a consumer version. Energy service consultants, for example, operate in commercial markets. They pay utility bills for clients and work to improve the energy efficiency of clients’ operations, sharing the savings with their clients. Given that many homeowners have utility expenses approaching \$1,000 per month, why not apply the energy services model to households?

6. Trend-driven innovation. Changes in technology, demography or social norms often create innovation opportunities. Ubiquitous cellular telephone service, for example, enables a wide variety of information delivery services. An increasing Spanish-speaking population in the United States, for example, enables new sorts of Spanish-language media. Growing environmental awareness creates a market for green products and services. Once again, the means of exploration is easy: list social, environmental, technological, or economic trends and then imagine innovation opportunities made possible by them.

7. Attribute-based innovation. Marketers typically think of products and services in terms of their attributes—cars, for example, possess fuel economy, style, speed, and ride quality. You can identify opportunities for differentiated offerings by considering these questions, suggested by Kim and Mauborgne in *Blue Ocean Strategy*⁶:

- Which attributes that are assumed to be required in an industry can be eliminated?
- Which attributes can be reduced substantially?
- Which attributes can be raised substantially above expectations?
- Which attributes can be introduced that are entirely new to the industry?

As an example, consider the attributes of an innovation in the financial services industry. Companies use stock exchanges in their search for additional funding. Often, this means going public. When preparing for an initial public offering, a company might consider using one of several stock exchanges. From the company’s perspective, relevant product attributes of stock exchanges include the required minimum capitalization, the exchange services the stock exchange offers, and the prestige of the stock exchange. Figure 2-4 shows how the NASDAQ rates along this set of attributes. This curve is often referred to as a value curve⁷⁸.

Figure 2-4 also shows how a recent innovation in the world of financial services stacks up compared to the NASDAQ. The Alternative Investment Market (AIM), created by the London Stock Exchange, is shown relative to the NASDAQ and the OTC Bulletin Board. The AIM does not have the stringent capitalization and revenue requirements of the NASDAQ, yet provides similar exchange services. Because of its location in the United Kingdom, which has fewer securities regulations than the United States, companies pay much less to go public on the AIM. AIM’s cheaper stock offerings change the competitive landscape for stock markets.

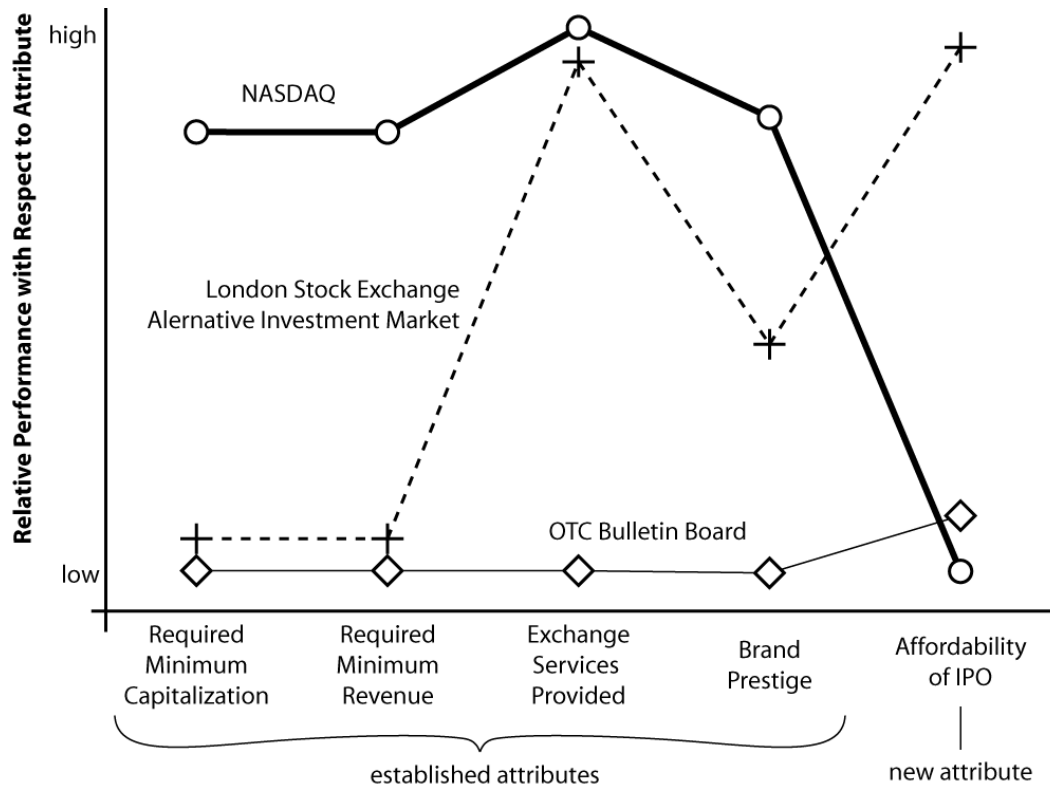


Figure 2-4. An attribute map for stock exchanges. The map compares the relative performance of three stock exchanges across a set of five attributes. The London Stock Exchange Alternative Investment Market innovates by emphasizing the affordability of an initial public offering (IPO), a new attribute for this product category.

8. Functional decomposition. Innovation opportunities sometimes arise through disturbances to one or a few elements of a business model. You can identify these elements by mapping the functions of the business. Almost any firm can be modeled along the lines of a generic template such as the one depicted in Figure 2-5. The firm first acquires customers through sales and marketing and then, through a second process, it delivers its product or service to them. These processes can be further broken down into sub-processes.

Opportunities for innovation exist at every juncture in the system. An innovator might identify new markets, new sales channels, new ways to locate customers or build relationships with them or new means of product or service delivery. You zero in on these sorts of opportunities by diagramming the key functions of a business and then considering what would happen if you changed one or more functions. Take the category of fractional jet ownership. NetJets sell shares in an airplane and then operates the aircraft in such a way as to ensure 30-minute response time to a request by an owner/customer. (This model is shown the upper part of Figure 2-5.) Could NetJets aggregate and coordinate available aircraft across its fleet and resell the capacity for air-taxi service (see lower part of the Figure)?

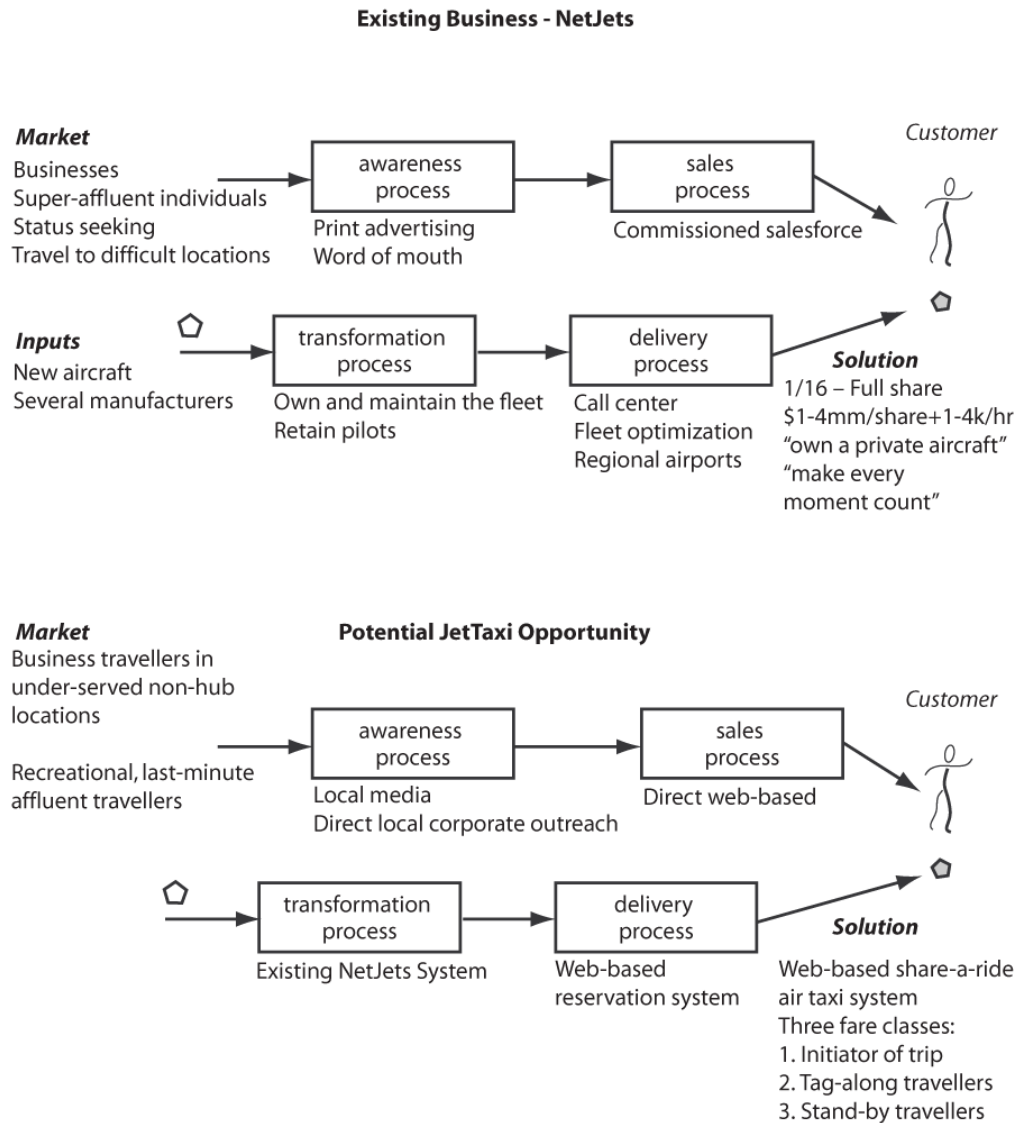


Figure 2-5. An example of a derivative to an existing business. At the top is a high level decomposition of the business model for the existing NetJets business, consisting of four functions. By changing one or several of the functions underlying the current business model, you create a new business model. At the bottom of the figure is one opportunity generated this way, an air taxi service.

Structuring the Front End of a Tournament

In the previous section, we outlined techniques that can guide you and your employees in generating opportunities. In our experience, virtually anyone can generate some interesting opportunities by following these guidelines. Engage a group of people in the process for a day or so, and you'll obtain dozens, if not hundreds, of ideas. In doing so, you'll have mined the raw ore from which you can extract exceptional opportunities. But how do you organize your ideas into a tournament? We now describe two approaches to innovation tournaments: a hands-on innovation

workshop and a web-based submission and evaluation system. We have used both of these approaches and comment on their relative advantages and disadvantages in the following pages.

Innovation workshop

To run an innovation workshop, assemble a group of 20 to 40 participants. Participants will typically come from inside your organization, but might also include customers, suppliers, or industry experts. If the set of people you would like involved in your innovation workshop gets too large, you might organize several separate workshops. You should try to recruit as diverse a group of participants as possible; you're better off having people from a variety of departments than having one workshop for marketing employees and another for accountants.

At the beginning of the workshop, define the scope of opportunities that you're seeking and explain why you are looking for opportunities of this type. For example, you might explain to the participants that you are seeking opportunities that help your brand be perceived as more environmentally friendly as this has emerged as a new customer requirement. Or, you might explain that you are seeking opportunities to expand into China, as this is an important growth market (see Chapter 5 for more details about how to define the scope of a tournament). Then, announce that the goal of the work-shop is to identify a small set of exceptional opportunities.

For the workshop, equip participants with some or all of the idea-generation tools reviewed above and allocate enough time. We have run workshops successfully in as little as an hour, but you may spend several hours over multiple sessions and weeks.

Start by asking people to spend 10 or 20 minutes generating ideas on their own. Then bring folks together in groups of four to five. Each group will generate further opportunities and clarify and articulate the complete set of opportunities generated. To complete their work, the groups should summarize each opportunity on a single sheet paper or on a separate flipchart page. (Chapter 4 explains how to organize, evaluate, and screen these opportunities in a workshop format.)

Web-based submission

An alternative to a workshop is online submission and evaluation. Along with this book, we've developed a web-based software tool, called the Darwinator, to manage the early rounds of an innovation tournament. The Darwinator is available for use by readers of this book through our website www.InnovationTournaments.com. You can also use your own web-based file-sharing system and survey tool.

We designed the Darwinator to allow any participant to submit opportunities comprising a title, description, and an image, if desired. The interface ensures anonymity, minimizing the effects of office politics. You give employees a deadline by which they must submit opportunities. We find that also setting a target of 5 to 10 opportunities stimulates participation. The amount of time allowed for submissions can vary. We have often allowed one or two weeks. Just as for the workshop, Chapter 4 will discuss how to evaluate the opportunities submitted this way.

Harnessing the Creative Abilities of Individuals and Groups

The creative few

You probably wouldn't be surprised to learn that different people in your organization have different levels of skill in singing or playing tennis. They probably also differ substantially in their ability to identify exceptional opportunities.

As part of our research, we studied opportunities identified by a group of 47 managers in the Wharton School's executive MBA program who were working together to create a new business. The executives had an average of 10 years of work experience. We asked each one to identify about five unique business ideas and submit them via the Darwinator. Each participant also evaluated about 100 opportunities submitted by his teammates, rating them on a scale of 1 to 10. The Darwinator then averaged the evaluations to produce an estimate of the quality of the opportunities.

Figure 2-6 is a histogram of the estimated quality of the opportunities generated by the group. The dark bars represent the opportunities generated by the top 25 percent of the group, based on the average quality of the opportunities they generated. You can see that the top few folks, as measured by the quality of their average ideas, generated most of the *best* ideas. (A formal statistical analysis of the data reveals that variation *across individuals* explains much of the variation in quality of the opportunities⁹.) We don't know if these differences spring from differences in talent, effort, or application of tools¹⁰. Regardless, if dramatic differences in ability persist over time, then you should focus your energies on harnessing the efforts of your best innovators rather than try to squeeze ideas out of those who don't excel at the task (but who may have other skills).

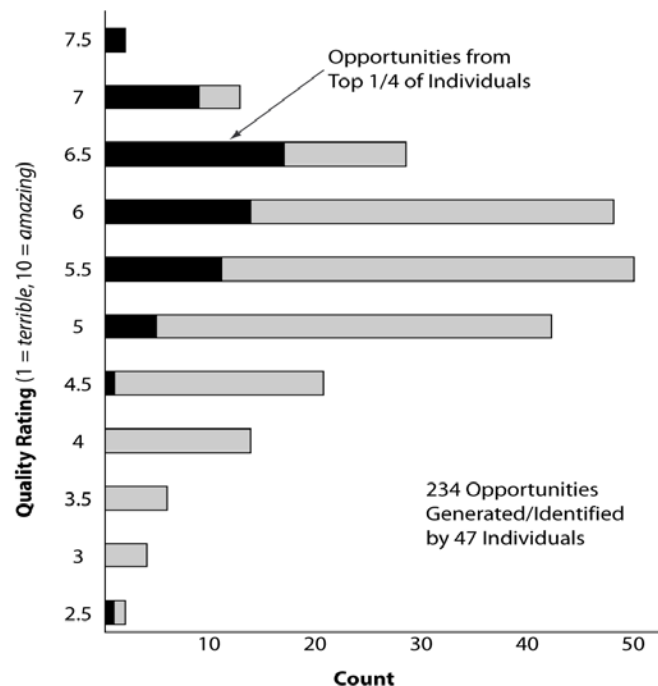


Figure 2-6. The quality distribution of opportunities generated by a group of 47 professionals and (in black) the opportunities that were generated by the top quarter of the group. (Source: authors' research.)

Working in groups

Business orthodoxy says that the best way to generate new ideas is to recruit a group and brainstorm. But dozens of studies have shown that, if the objective is to generate lots of ideas, then people working independently will outperform those same folks working together¹¹. Our own research shows that, per unit of time invested, individuals are three to seven times more productive in generating ideas than are the same people in a group.

Why? In a conventional meeting people speak consecutively, and that becomes a bottleneck. Likewise, group dynamics may inhibit individuals from freely expressing their ideas: some people are shy; others are intimidated. But while the number of ideas generated by individuals working separately is substantially higher, our research also suggests that group sessions can produce more varied ideas, some very good and some very bad. With increased variation comes an increased chance to discover exceptional opportunities¹².

Deadlines and deliverables

A weakness of groups is that people often don't do their "homework" when charged with identifying opportunities. Below you'll find techniques for encouraging them to meet deadlines and deliver ideas.

- **Use an online submission tool.** We've already mentioned the Darwinator, which is available for your use. You may find other online tools, or you may create your own. In our experience, when we require that people submitted opportunities online by a deadline, compliance improves.
- **Schedule a workshop.** A reality of the workplace is that individuals, especially in larger firms, seldom find time to work alone in generating ideas. The benefit of an innovation workshop is that you reserve time explicitly for generating opportunities, time that might otherwise be eaten up by emails and phone calls. You can even invite employees to the workshop and then immediately ask them to work individually during the allocated time. This may be the only way to get people to devote the necessary time to the task.
- **Numerical targets.** When assigning individual work, provide a specific target for the number of opportunities to be generated. The number will depend on the domain. If generating product or company names, you might pick 50 or 100, but for new business models, you might say 3. Your targets can be used in multiple phases. We sometimes assign individuals to generate, say, 10 opportunities for a first meeting. Then, we ask them to generate another 10 for the next meeting. That's less daunting than requiring 20 from the start.
- **Templates.** To summarize ideas, we use a one-page template that includes graphically defined regions for a title, a sketch, and a description. When faced with a template, individuals tend to fill in the required elements. There is something about a form that prompts them to fill in the blanks. Templates not only seem to spur individuals and groups to be more assiduous in their thinking and preparation, they also help to standardize descriptions for comparison. A well-designed template can also make a fine display device for opportunities when posted on the walls of a meeting room.

Summary

Organizations typically generate about half of their opportunities for innovation internally. Since opportunities are the key ingredients for successful innovation tournaments, improving your opportunity generation is critical.

In this chapter, we've presented several techniques to help you improve. Other tools are available from our website. As we will discuss in the next chapter, you should complement your internally generated opportunities with ones from outside of your firm. Remember, the more opportunities that compete in your tournament, the better the odds for an exceptional opportunity.

Opportunities are generated by human beings, not by machines. People are unpredictable and heterogeneous. Some are much better than others at generating opportunities. Try to identify your best players and invest in their efforts. Tools that facilitate idea generation include online submission, templates, and numerical targets.

Diagnostic

These questions serve as a diagnostic for the effectiveness of your opportunity generation processes:

- What fraction of the opportunities you consider is generated internally by members of your staff?
- Have you identified the few individuals in your organization that are particularly good at generating opportunities?
- Have you trained your staff in techniques for generating opportunities?
- Do you and your employees regularly devote time and effort to generating opportunities?
- How do you structure the front end of the tournament process to capture opportunities generated internally?
- What templates and other administrative techniques do you apply to the opportunity generation process?

Chapter Notes

¹ Figure 1-11 in the previous chapter analyzes this more formally. Also see P. Drucker, “The Discipline of Innovation,” *Harvard Business Review*, Vol. 76 (Nov/Dec 1998): 149-157.

² R. Leifer, C.M. McDermott, G.C. O’Connor, and L.S. Peters, *Radical Innovation: How Mature Companies Can Outsmart Upstarts* (Boston, MA: Harvard Business School Press, 2000).

³ B. Nalebuff and I. Ayre, *Why Not? How to Use Everyday Ingenuity to Solve Problems Big and Small*, (Boston, MA: Harvard Business School Press, 2003).

⁴ Scott A. Shane, *Finding Fertile Ground: Identifying Extraordinary Opportunities for New Ventures*. (Upper Saddle River, NJ: Wharton School Publishing, 2005).

⁵ Alan Lafley, “Why P&Gs Smile is so Bright,” *Business Week*, August 12, 2002, 58.

⁶ W. Chan Kim and Renée Mauborgne, *Blue Ocean Strategy*, (Boston, MA: Harvard Business School Press, 2005).

⁷ W. Chan Kim and Renée Mauborgne, *Blue Ocean Strategy*, (Boston, MA: Harvard Business School Press, 2005).

⁸ Note that from a methodological perspective, the dots in Figure 2-4 should not be connected since there exists no logic to the ordering of the attributes and the value of the y-axis really has no meaning at the mid-point between two attributes. Yet, given that this form of attribute map is widely used in practice, we show in the format of Figure 2-4.

⁹ K. Girotra, C. Terwiesch, and K. Ulrich, “Idea Generation and the Quality of the Best Idea,” working paper, The Wharton School, Philadelphia, 2007.

¹⁰ There exists some research that links idea generation to personality as measured by the commonly used Myers-Briggs survey. See Stevens, G.A. and J. Burley, “Piloting the Rocket of Radical Innovation,” *Research Technology Management*, Vo. 46, Issue 2 (Mar/Apr 2000): 16-26.

¹¹ J. Goldenberg and D. Mazursky, *Creativity in Product Innovation*, (Cambridge, UK: Cambridge University Press, 2002).

¹² For the substantial body of research that has been done on this topic, see Diehl, M. and W. Stroebe, “Productivity Loss in Brainstorming Groups: Towards the Solution of a Riddle,” *Journal of Personality and Social Psychology*, Vol. 52, No. 3 (1987): 497-509.

Sensing Opportunities Externally

Innovators work inside big established firms like Microsoft, Pfizer, and Honda and in startups from Shanghai to Silicon Valley. Their efforts improve their firms' competitive prospects. But opportunities for innovation also bubble outside of firms in places like university labs and hobbyists' garages. Thus, in addition to generating opportunities internally, innovative firms must also sense them externally.

Consider the success story of the energy drink Red Bull. The Austrian entrepreneur Dietrich Mateschitz created an impressive business with sales of 3.5 Billion cans of the sweet and caffeinated drink in 2007 (and two Formula 1 teams and a soccer club). But he didn't invent it. He found it. The original recipe was developed in Thailand by a company called TC Pharmaceutical and sold under the Thai name 'Krating Daeng.' Truck drivers, construction workers, farmers, and other people who worked long hours liked to consume it to fight fatigue.¹

Mateschitz worked in Thailand for a German toothpaste company. On one of his trips to the country, he tried Krating Daeng and found that it helped ease his jet lag. In 1987, he adapted the recipe to Austrian tastes by adding carbonation and cutting the sweetness. Sales soon took off. Mateschitz's company now competes with such beverage industry giants as Coca-Cola and Pepsico.

Like Mateschitz, successful innovators need to scan their environment, sensing opportunities from customers, suppliers, competitors, universities, and companies in distant geographic regions. This chapter will help you do that by showing you how to understand when externally generated opportunities matter most and how to set up sensing mechanisms to help you identify them.

When External Innovation is Most Important

Innovation in the aircraft industry demands technical expertise, large development teams, and lots of money. Innovation in snack foods requires little more than a home kitchen. The *minimum required scale* for innovation helps to determine whether innovation should be done internally or, at least partly, externally.

A team of thousands of people at Boeing, for example, developed the 787 Dreamliner commercial airframe at a cost of billions of dollars.² Boeing can be confident that a couple of latter-day Wright brothers won't cobble together a competing plane in their garage. The Coca-Cola Co., in contrast, enjoys no such comfort. Competitors like Red Bull can pop up anywhere.

In some fields, innovation requires deep expertise but only modest amounts of money. Individual surgeons, for example, have created many orthopedic devices, including the Ace-Fischer Fixator. Recognition of the need required expertise, but creation of a solution called for only a modest investment in basic mechanical design and fabrication.

Many web-based innovations also require industry-specific smarts but neither decades of experience nor scads of money. Witness YouTube, created by Chad Hurley, Steve Chen, and Jawed Karim, former PayPal employees. They devised their basic website, which plays videos over the web, in a matter of months in early 2005 and sought venture capital only after launching it. In the world of the so-called Web 2.0, the biggest expenses for software entrepreneurs are typically rent, a handful of desktop computers, and plenty of late-night pizzas and Red Bull.

If you operate in a resource- and expertise-intensive industry like Boeing's (i.e., the minimum required scale is large in your industry), your firm is protected, to some extent, from

guerilla innovators and garage hobbyists, and you can invest less in sensing and scanning activities. You can focus more on internal generation than on external sensing. But if you operate in a field like YouTube's, you must be sensitive to opportunities discovered and exploited by innovators outside of the core group of established players. Figure 3-1 illustrates two key dimensions associated with the resources required for innovation.

Industries in which the minimum required scale of innovation is large are on the right of the chart. By and large, these industries are protected from guerilla innovators. If you find yourself located on the left, however, you need to be watchful. In the upper left corner of the chart, new opportunities are most likely to be produced by a highly skilled professional, potentially working for a research lab or a university. In the lower left corner, you might find your next competitor operating in a small bar or a home kitchen right now.

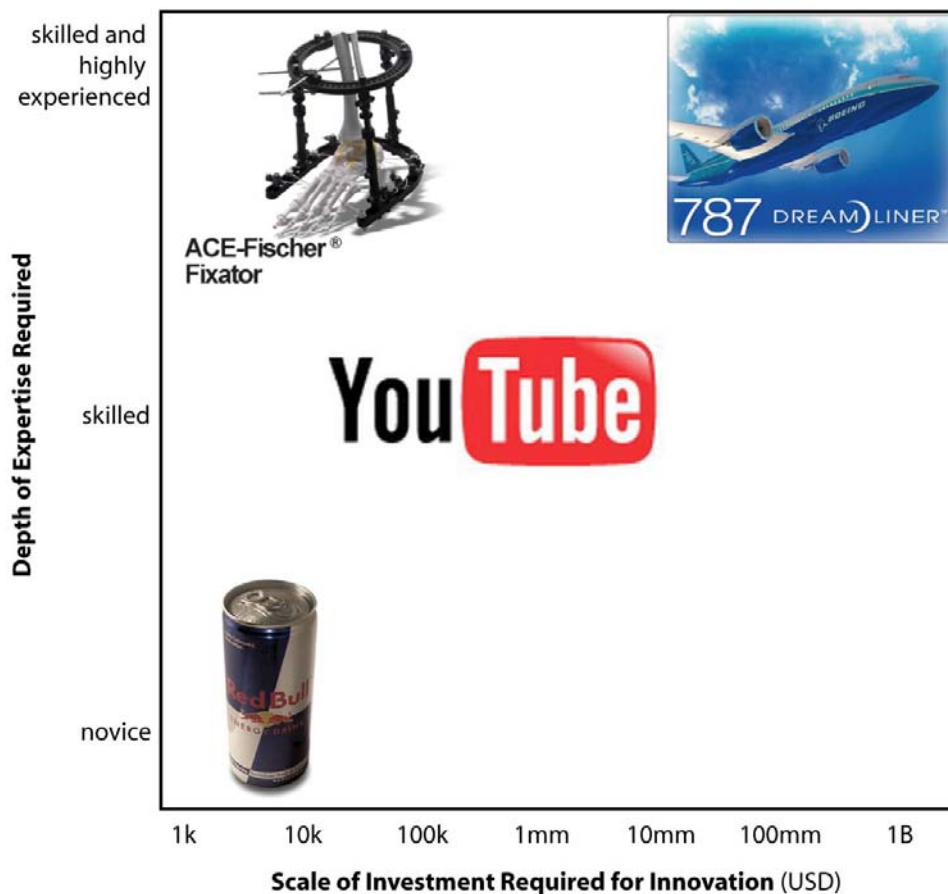


Figure 3-1. Together, two factors—depth of domain expertise and magnitude of financial commitment—can be used to map the resource-intensity of innovating in different fields.

Where to Sense Externally

Sensing opportunities externally requires that you scan the world around you. You can't wait until opportunities come to you. In this section, we discuss ways you can do this. Often, after you've identified external opportunities, you follow up with the internal generation of

alternatives. Again, consider Red Bull. Mateschitz sensed the initial opportunity externally. But he also adapted it to the local tastes of the Austrian market—a process that probably included substantial internal generation efforts.

The following pages describe a set of techniques that help you create new opportunities by sensing innovation activities outside your organization.

1. Import geographically isolated innovations. Innovations are often geographically isolated, particularly if introduced by smaller firms. Translating the innovation from one geographic region to another can be a source of innovation. Again, recall the Red Bull story. What started as a product for Thai cab drivers became the drink for New York investment bankers and Silicon Valley tech geeks. This example by no means is unique. Witness Starbucks. Founder Howard Schultz created the chain after visiting Milan and becoming infatuated with its café culture and espresso-based drink concoctions.

You can sense opportunities by identifying outstanding products or services in a distant region and then considering how you might adapt them to a different place. For example, what about face masks worn in Japan to prevent the spread of viruses? What about the automated bicycle rental systems deployed widely in Oslo and Paris?

2. Identify small companies with niche products that have the potential for broader market appeal. Small companies can thrive in the ecological niches ignored by large companies. These niches can support the development of an opportunity to the point where much of the risk and uncertainty has been resolved. On occasion, an innovation made in a niche will be suitable for a much larger market.

For example, a small company in California called Gyration developed a hand-motion sensor technology for television remote controls. The gaming company Nintendo sought out and acquired this technology for use in the Wii video game remote control, an application with an enormously larger market than the niche market originally addressed by Gyration (Figure 3-2). The Wii became an enormous success and sold more than 20 million units by the end of 2007.³



Figure 3-2. The remote control for the Wii gaming system by Nintendo embodies a technology originally developed for a niche application by a small company named Gyration. (Source: *GNU Free Document License, Wikipedia media file*)

3. Cherry-pick from a full-line company. Larger companies tend to grow in part by gradually adding products. As a result, many of them have hefty product lines and knotty supply chains and need complex production systems to support them. If a competitor produces only one product, but in the richest part of the market, it can often do so at dramatically lower cost. The product can often be sourced from a third party, reducing fixed costs, and then priced attractively. The established firm may be hamstrung in its ability to respond because of a reluctance to abandon its full-line strategy. Think of this as the guerilla approach: you find a diversified and preferably complacent company and then offer its highest-margin product or service at a better price.

4. Identify lead users and study their innovation activities. Firms have ample incentive to innovate. Innovation, after all, can result in new sources of cash. But lead users and independent inventors may have even greater incentives. Lead users are people or firms that have advanced needs for products or services that are not being met by other companies.⁴ They must either tolerate their unmet needs or innovate themselves to address them. Take Dr. Lillian Aronson, a veterinarian at the University of Pennsylvania who performs feline liver transplants. Her procedure is relatively new, the market is small, and few existing surgical tools fit the task. Dr. Aronson thus has to choose between ill-suited instruments and inventing her own. If she invents a useful device, she creates an opportunity for further innovation by an established firm.

5. Listen to independent inventors (and let them shoulder the risk of failure). Independent inventors likewise create new solutions. Their motives just differ—and often defy the simple calculus of dollars and cents. Research by Åstebro⁵ on about 2,000 inventions by independent inventors found that a majority of their inventions lost money and that, even looking across all inventions as a group, inventors lose money on average. Why would people pour time into something with such poor returns?

They could be hobbyists, wild optimists, or even “lottery players,” attracted to mathematically unfair games that provide a very small chance of an enormous return. Regardless of their motives, independent inventors do toil in many fields. Most of their efforts don’t result in successful innovation, but a tiny fraction of inventors do manage to identify a match between an unmet need and a new solution. These matches may provide opportunities for existing firms through licensing or acquisition.

One way you can identify independent inventors by participating in online communities. For example, we found the opportunity “SpoilMySpouse” (see Figure 1-7 in the introduction chapter) at the web-based innovation network Cambrian House (www.cambrianhouse.com)⁶. This site, and several others, are used by independent inventors to present, discuss, and refine the opportunities they work on.

6. Cooperate with universities. The first large-scale digital computer was invented at the University of Pennsylvania four blocks from where we wrote this book. Today Penn is the source of many commercial innovations in medicine and other fields. Major research universities are wellsprings of opportunities and have produced such successes as Google (Stanford), Genzyme (MIT) and many others.⁷ Some of the opportunities spring from faculty-led research, particularly in the life sciences. Others are created by the legions of bright young students who enroll to chart new directions in their lives and careers. Engaging with universities usually requires a multi-faceted approach. You can recruit on-campus for interns and employees, sponsor new product-design and business-plan competitions, join research consortia, and participate in campus conferences and events.

Creating Mechanisms for Sensing Opportunities Externally

Viktor Gordeyev, a Russian aircraft engineer, wanted to run and jump without tiring, so he conceived a way to marry running shoes with tiny gas-powered engines and pogo-stick like pistons. His invention, which resembles stilts more than shoes, enables a runner to move at 22 m.p.h. (Figure 3-3). But the Russian army claimed the shoes, and they languished as a classified secret for years. After they were declassified in the mid-'90s, an entrepreneur tried to commercialize them, but they never caught on.⁸

Granted, gas-powered shoes have their drawbacks—the engines can misfire, throwing a runner off balance—but they're just the kind of extreme opportunity that should be detected by innovators working in the field of transportation. Recall our argument from the introduction: your number of exceptional opportunities can be increased by (1) increasing the average quality of your opportunities (2) increasing the number of them, and (3) increasing the variance in their quality. If gas-powered shoes aren't a "high variance" idea, then what is?

And thus we shift to the task of sensing, that is, finding novel ideas like Gordeyev's piston-powered shoes. In particular, we suggest four ways of sensing opportunities externally: passive reception, active scanning, social networking, and innovation contests.



Figure 3-3. Boots powered by internal combustion and created by an independent inventor, Russian engine designer Viktor Gordeyev. (Source: Joseph Sywenkyj/Redux)

Passive reception of opportunities

If you operate in a field where thousands of talented people vie for attention, you might simply announce your needs and await the flood of submissions. First Round Capital, for example, is an early-stage venture fund with a stellar reputation among entrepreneurs, as reflected in a top rating on the popular website TheFunded.com. As a result, the firm sees dozens

of unsolicited business plans every week. (Even popular venture capitalists will, however, say that while they look at every single plan that they receive passively, they also have to work actively to solicit the best opportunities.) A few other fields are buyers' markets, including the movie and music businesses and professional athletics. If you don't work in one of these fields, you may still benefit from soliciting submissions from outsiders but can't rely on it as your only source of opportunities.

Active scanning of communication channels

Journalists, bloggers, and conference organizers are in the business of sensing. While their insights are available to everyone, you cannot ignore the opportunities that they reveal. Several members of your organization should therefore actively scan the channels that are relevant to your business. Here are a few of the communication channels useful in identifying opportunities for innovation in consumer products and services enabled by the internet.

| Print Media | Web-Based Media | Events |
|---------------------|-----------------------------|---------------------------|
| New York Times | Technorati.com | TED |
| Wall Street Journal | SocialComputingMagazine.com | Consumer Electronics Show |
| Wired | Lifehacker.com | |
| Business Week | Knowledge@Wharton | |
| Fortune | | |
| Inc. | | |

Table 3-1: Examples of communication channels useful in identifying opportunities in internet services.

Of course, cardiology will have very different channels, including some listed here:

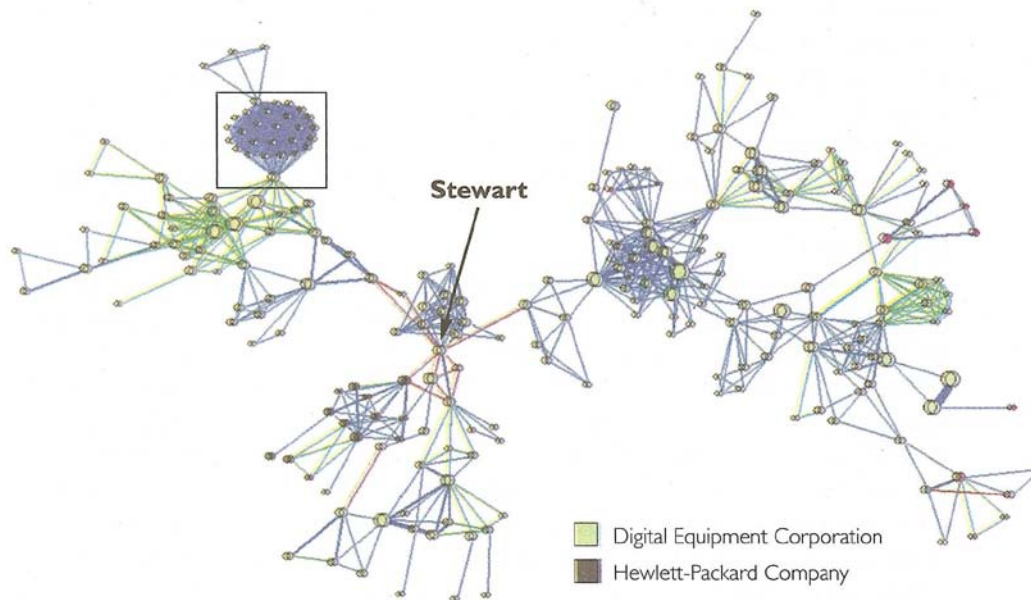
| Print Media | Web-Based Media | Events |
|-----------------------------------|------------------------|-------------------------------|
| New England Journal of Medicine | Acc.org | ACC Annual Scientific Session |
| Circulation | Cardiosource.com | ACC i2 Summit |
| J. American College of Cardiology | Medbioworld.com | |
| European Heart Journal | | |
| Science | | |
| Nature | | |

Table 3-2: Examples of communication channels useful in identifying opportunities in cardiology.

Representation in social networks

Another way to increase the keenness of your sensing is to ensure that your firm hires and retains people who are connected to the right social networks. Consider the network of inventors

depicted in Figure 3-4. A few gatekeepers link the otherwise tightly clustered groups of inventors. In this network, one would prefer to employ Robert Stewart, an engineer at Digital Equipment Corporation, rather than someone on the periphery of the network. Stewart's links to several clusters give him efficient access to opportunities arising throughout the network.⁹



Robert Stewart, by facilitating the flow of information among three locally cohesive but insular clusters, turned Digital Equipment Corporation into a small world (though a small world that remained relatively unconnected to other firms). In contrast to Robert Stewart's bridging connection, the box illustrates highly clustered inventors.

Figure 3-4. A network of inventors in Boston circa 1986-1990. One man, Robert Stewart, connects several otherwise isolated networks. (Source: Fleming and Marx, *California Management Review*.)

Social institutions of all kinds facilitate communication among innovators. Some of these institutions may not be related to professional life. Cricket and softball leagues in Silicon Valley are widely known to be hotbeds of entrepreneurial activity and have played a key role in facilitating the exchange of ideas leading to opportunities for new ventures.

Innovation contests

Still another approach to sensing opportunities can be found in innovation contests. In an innovation contest, individuals or teams submit plans or prototypes, which are typically judged by experts, sometimes with the help of panels of users. The evaluators rank the raw ideas or sometimes early prototypes.

TV retailer QVC's product road show uses this approach. It visits 10 cities in the United States annually to screen new products. Staples, the office-supplies retailer, likewise encourages consumers to submit product proposals. In return, the creators receive royalties if the company introduces their ideas. It's a double win. Staples gets inexpensive ideas, while its most creative customers earn extra money.¹⁰ Figure 3-5 shows four products that the company launched in this way.

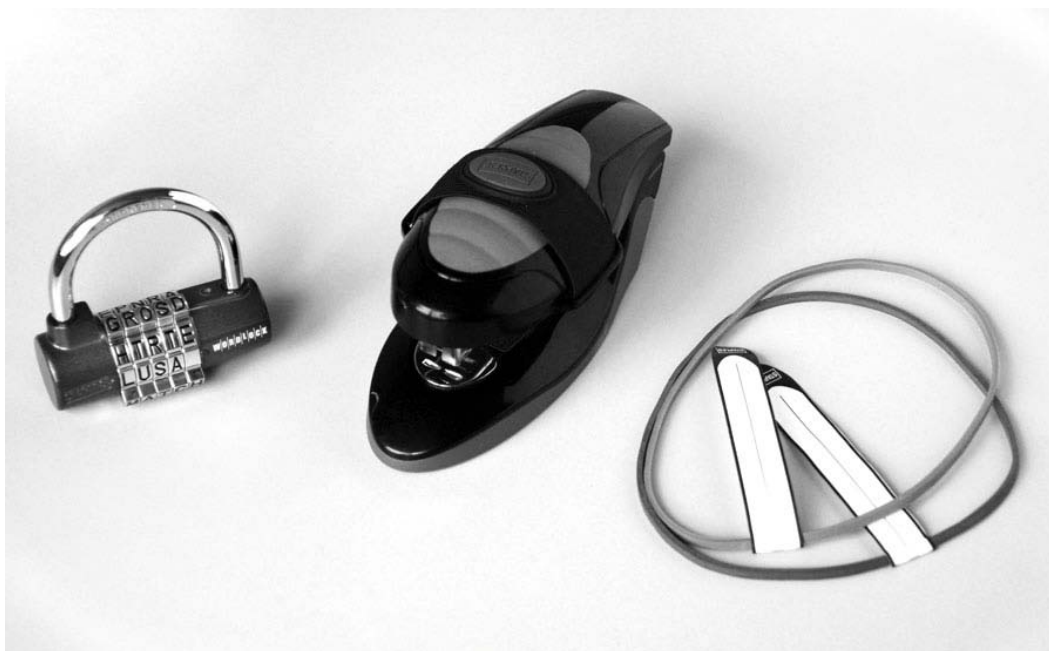


Figure 3-5. Staples has obtained these products by relying on an external creation of opportunities: Wordlock (left), Handy Strap Stapler (center), and Rubber Bandits (right). (Source: Authors' photo)

Even the U.S. government uses innovation contests. The U.S. Defense Advanced Research Projects Agency (DARPA) entices inventors to enter its Grand Challenge for autonomous robotic vehicles (ARVs), which have explored the surface of Mars, among other uses, with offers of prize money. The winner of the DARPA's 2006 Desert Challenge received \$2 million. DARPA, for its part, obtains ideas for ARV innovations that would be hard to develop internally.

This sort of competition can quickly and inexpensively create a broad range of ideas from a diverse set of inventors. The ideas then can be refined by professional development teams and tested with traditional market research. Contests also often manage to tap into inventors' nonfinancial motives like the bragging rights that come with winning and seeing an invention turned into a commercial product. Few people can claim that their idea has made it onto the surface of Mars. What's more, contest participants, often lacking financial backing and easy access to capital markets, typically couldn't handsomely benefit from their innovations if they kept them to themselves.

The company Innocentive is specialized in organizing innovation contests for a wide range of business settings. It allows corporations, government agencies, and non-profit organizations to publish a problem related to research and development to a large community of innovators around the world. The best solutions are then rewarded with prize money ranging from \$5,000 to \$1,000,000. Whether the problem is to find a new catalyst for a chemical reaction or a new product concept, this form of an innovation contest provides a diverse set of new opportunities.

Summary

Finding exceptional opportunities requires that the innovation process be fed with rich and abundant raw material. For the purpose of the innovation tournament, it doesn't matter if opportunities originate internally or externally. But if you are operating in an industry in which the minimum required scale for innovation is low, sensing opportunities externally is a must. Tapping into a network of independent inventors, in particular, can be an efficient way to harvest opportunities. If they're hobbyists, they may chase after mostly impractical ideas, but that won't matter to them. They're often pursuing a passion, not payoff.

External opportunities can be found in many other places, too, including in faraway and niche markets, full-line companies with complex product lines, lead users, and universities. Avail yourself of all of them.

The timing of your sensing matters, too. Sensing the opportunity when it appears on the front page of the *Wall Street Journal* is easy, sensing it when being driven in a cab in Thailand is not. So sensing is most beneficial when the signal that you are sensing is still weak. And for that, you have to listen very carefully.

In this chapter, we have discussed several mechanisms that facilitate the sensing of external opportunities at times when the opportunities are still at an embryonic stage and the corresponding signals are weak. We discussed the passive receipt of opportunities, an active scanning of communication channels, participation in social networks, and innovation contests.

All these efforts lead to the identification of additional opportunities. They are added to the list of internally generated opportunities that you obtained from your internal generation efforts. Now, the contestants are assembled. It is time for the first round of elimination.

Diagnostic

These questions serve as a diagnostic for the opportunity generation phase of the innovation process:

- What are the relative ratios of the sources of opportunities? Do a lot of opportunities come from customers, competitive products, partners, independent inventors, distribution partners, and from structured exploration within the firm?
- What is the minimum scale of resources for innovating in your industry? How much specialized expertise is required? Where, therefore, are opportunities likely to come from?
- What are the information channels containing opportunities relative to your business? Who is scanning them?
- What small companies are active in your field? Do you have contacts and relationships with them?
- Do you have a policy and mechanism for receiving submissions from external innovators?
- Have you considered running an innovation contest to stimulate the creation of opportunities outside of your company?

Chapter Notes

¹ Wikipedia, “Red Bull,” Wikipedia, the free encyclopedia website, July 2007

http://en.wikipedia.org/wiki/Red_bull.

² John Dodge, “Will Boeing’s 787 Dreamliner Improve the Flying Experience?,” *Design News* Vol. 62, Issue 8 (June 4, 2007): 11.

³ Wikipedia, “Nintendo Wii,” Wikipedia, the free encyclopedia website, March 2008,

http://en.wikipedia.org/wiki/Nintendo_Wii.

⁴ E. Von Hippel, *The Sources of Innovation* (Oxford: Oxford University Press, 1988).

⁵ T. Astebro, “The Return to Independent Invention: Evidence of Unrealistic Optimism, Risk Seeking, or Skewness Loving?,” *The Economic Journal*, Vol. 113 (January 2003): 226-239.

⁶ There exist a wide range of business models that support innovation tournaments directly or indirectly. See Chesbrough, H., *Open Business Models: How to Thrive in the New Innovation Landscape* (Boston: Harvard Business School Press, 2006)

⁷ Scott A. Shane, *Academic Entrepreneurship: University Spinoffs and Wealth Creation* (Cheltenham: Edward Elgar Publishing, 2004).

⁸ Andrew Kramer, “These Boots Were Made for 22 M.P.H.,” *The New York Times*, March 17, 2007.

⁹ L. Fleming and M. Marx, “Managing Creativity in Small Worlds,” *California Management Review*, 48 (4) (2006): 6-27.