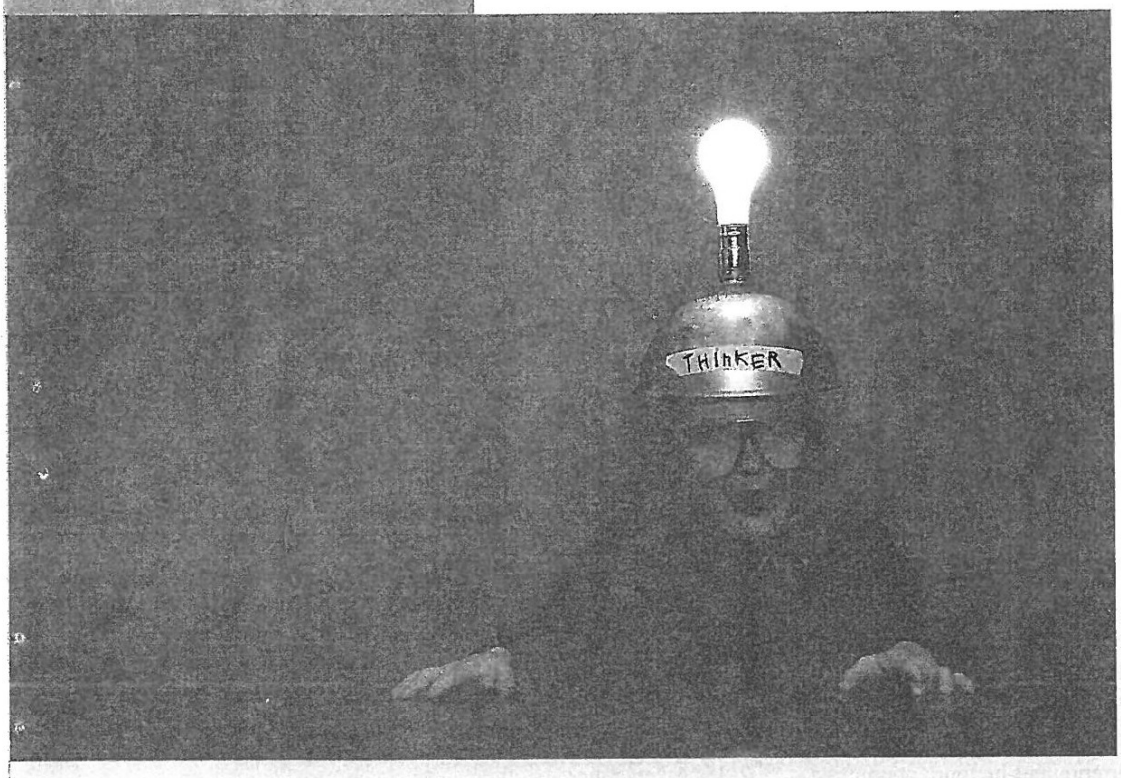
3 Inside the Entrepreneurial Mind: From Ideas to Reality



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Learning Objectives

On completion of this chapter, you will be able to:

1. Explain the differences among creativity, innovation, and entrepreneurship.
2. Describe why creativity and innovation are such an integral part of entrepreneurship.
3. Understand how the two hemispheres of the human brain function and what role they play in creativity.
4. Explain the 10 "mental locks" that limit individual creativity.
5. Understand how entrepreneurs can enhance the creativity of their employees as well as their own creativity.
6. Describe the steps in the creative process.
7. Discuss techniques for improving the creative process.
8. Describe the protection of intellectual property through patents, trademarks, and copyrights.

One of the tenets of entrepreneurship is the ability to create new and useful ideas that solve the problems and challenges people face every day. Entrepreneurs achieve success by creating value in the marketplace when they combine resources in new and different ways to gain a competitive edge over rivals. From Alexander Fleming's pioneering work that resulted in a cure for infections (penicillin) and the founders of the Rocket Chemical Company's fortieth try to create an industrial lubricant (WD-40) to Jeff Bezos's innovative use of the Internet in retailing (Amazon.com) and Ted Turner's around-the-clock approach to the availability of television news (CNN), entrepreneurs' ideas have transformed the world.

As you learned in Chapter 1, entrepreneurs can create value in a number of ways—inventing new products and services, developing new technology, discovering new knowledge, improving existing products or services, finding different ways of providing more goods and services with fewer resources, and many others. Indeed, finding new ways of satisfying customers' needs, inventing new products and services, putting together existing ideas in new and different ways, and creating new twists on existing products and services are hallmarks of the entrepreneur!

Since Earl Dickson invented the Band-aid in 1920 for his wife, who experienced frequent cuts while preparing food, entrepreneurs have been working to improve the simple but effective invention. Tsai Cheng-Yu and Hsu Hao-Ming, two students at Shih Chien University in Taiwan, created the AmoeBAND, a Band-aid with cut-away sections that allow it to be adjusted to fit the location of the wound so that it stays on and a sensor that alerts the wearer if the wound becomes infected. Inventors at the European Center of Innovative Textiles in Lille, France, have developed a new fabric for use in dressing wounds that incorporates antiviral, antibacterial, and other medicines into the fibers. They also are experimenting with nonwoven textiles that serve as seeds for rebuilding human tissue. Jeff Skiba, a former medical consultant and founder of Vomaris Innovations, won approval from the Food and Drug Administration (FDA) for an adhesive bandage called Procellera that is equipped with microscopic batteries that pass a small amount of electrical current (just 1.2 volts) over the injured area to accelerate the healing process.[1] Like many innovators, these entrepreneurs have achieved success by taking a common item, bandages, that had existed for many years and looking at it in a different way.

Creativity, Innovation, and Entrepreneurship

LO1

Explain the differences among creativity, innovation, and entrepreneurship.

According to the Battelle *R&D Magazine*, U.S. companies, government agencies, and universities invest more than $465 billion annually in research and development (R&D).[2] Small companies are an important part of the total R&D picture. One study by the Small Business Administration reports that small companies produce 16 times more patents per employee than their larger rivals. What is the entrepreneurial "secret" for creating value in the marketplace? In reality, the "secret" is no secret at all: It is applying creativity and innovation to solve problems and to exploit opportunities that people face every day. **Creativity** is the ability to develop new ideas and to discover new ways of looking at problems and opportunities. **Innovation** is the ability to *apply* creative solutions to those problems and opportunities to enhance or enrich people's lives. Harvard's Ted Levitt says creativity is *thinking* new things and innovation is *doing* new things. In short, entrepreneurs succeed by *thinking and doing* new things or old things in new ways. Simply having a great new idea is not enough; transforming the idea into a tangible product, service, or business venture is the essential next step. "Big ideas are just that—ideas—until you execute," says Krisztina Holly, an entrepreneur who serves on the National Advisory Council for Innovation and Entrepreneurship.[3]

creativity
the ability to develop new ideas and to discover new ways of looking at problems and opportunities.

innovation
the ability to apply creative solutions to problems and opportunities to enhance or to enrich people's lives.

Successful entrepreneurs develop new ideas, products, and services that solve a problem or fill a need and, in doing so, create value for their customers and wealth for themselves. As management legend Peter Drucker said, "Innovation is the specific instrument of entrepreneurs, the act that endows resources with a new capacity to create wealth."[4] In a world that is changing faster than most of us ever could have imagined, creativity and innovation are vital to a company's success—and ultimate survival. That's true for businesses in every industry—from automakers to tea growers—and for companies of all sizes. A recent survey by Adobe of people in the world's five largest economies reports that 80 percent of people believe unlocking creative potential is the key to economic and societal growth, yet only one in four people say they are living up to their creative potential. In addition, the survey reveals a creativity gap, in which 75 percent of

respondents say they are under increasing pressure to be productive rather than creative; yet just 25 percent of their work time is devoted to creativity. The primary barrier to creativity on the job? Lack of time. In addition, 59 percent of the survey's respondents say their educational systems stifle individual creativity.[5]

Although big businesses develop many new ideas, creativity and innovation are the signatures of small, entrepreneurial businesses. Creative thinking has become a core business skill, and entrepreneurs lead the way in developing and applying that skill. In fact, creativity and innovation often lie at the heart of small companies' ability to compete successfully with their larger rivals. Even though they cannot outspend their larger rivals, small companies can create powerful, effective competitive advantages over big companies by "out-creating" and "out-innovating" them! If they fail to do so, entrepreneurs don't stay in business very long. Leadership expert Warren Bennis says, "Today's successful companies live and die according to the quality of their ideas."[6]

Some small businesses create innovations *reactively* in response to customer feedback or changing market conditions, and others create innovations *proactively*, spotting opportunities on which to capitalize. Sometimes innovation is *revolutionary*, creating market-changing, disruptive breakthroughs that are the result of generating something from nothing. More often, innovation is *evolutionary*, developing market-sustaining ideas that elaborate on existing products, processes, and services that result from putting old things together in new ways or from taking something away to create something simpler or better. Apple did not invent the digital music player, but Steve Jobs's company created a player that was easier to use and offered a "cool" factor that existing MP3 players did not have. One experimenter's research to improve the adhesive on tape resulted in a glue that hardly stuck at all. Although most researchers might have considered the experiment a total failure and scrapped it, this researcher asked a simple, creative question: What can you do with a glue when you take away most of its stickiness? The answer led to the invention of one of the most popular office products of all time: the Post-It note, a product that now includes more than 4,000 variations.

Entrepreneurial innovation encompasses not only new products and services but also new business models. As graduate students, Larry Page and Sergey Brin, cofounders of Google, realized that the Internet's ocean of information had outpaced people's ability to locate the information they wanted with existing search engines. Convinced that Internet users would value more relevant search results, the entrepreneurs developed a new service, Google's PageRank system, an algorithm that screens Internet searches and organizes them to produce the most relevant results. As traffic on their search engine grew, the young entrepreneurs created a new business model that involved selling advertising space (paid listings) by auctioning to businesses key words that visitors used in their searches. Today, their innovative business model accounts for 91 percent of Google's revenue (nearly $51 billion annually), and Google dominates the search engine market with 68 percent of all searches conducted.[7]

Some entrepreneurs stumble onto their ideas by accident but are clever enough to spot the business opportunities they offer.

ENTREPRENEURIAL PROFILE: Brian Levin: Perky Jerky Serial entrepreneur Brian Levin, who created the first text-message voting system (the one used on *American Idol*), and a friend were on a chairlift on the snowy slopes in Snowbird, Utah, one morning when Levin reached into his backpack for a package of beef jerky. Unfortunately, an energy drink had spilled onto the package, soaking the jerky, but Levin and his friend were hungry and ate it anyway. As they skied down the mountain, the duo experienced an energy boost. The jerky, now quite tender because of its soaking, had taken on the characteristics of the energy drink but had retained its peppery flavor. Inspired, Levin spent the next two years working with a food laboratory to refine a process for making an energy-boosting jerky around which he built a company to market the new product, which he named Perky Jerky. The company now generates annual sales of $10 million.[8] ■

More often, creative ideas arise when entrepreneurs look at something old and think something new or different. Legendary Notre Dame football coach Knute Rockne, whose teams dominated college football in the 1920s, got the idea for his constantly shifting backfields while watching a burlesque chorus routine! Rockne's innovations in the backfield (which

included the legendary "Four Horsemen") and his emphasis on the forward pass (a legal but largely unused tactic in this era) so befuddled opposing defenses that his teams compiled an impressive 105-12-5 record.[9]

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ENTREPRENEURIAL PROFILE: Brian Spaly: Trunk Club Brian Spaly, who cofounded pants retailer Bonobos while in college, recently became CEO of Trunk Club, a Chicago-based company that has taken the concept of a personal shopper that many upscale department stores provide for their best clients and moved it online. Fashion-challenged men around the world who need to dress well but do not enjoy shopping can go to the Trunk Club Web site and join for free. After answering some basic questions about their sizes and fashion preferences, they gain access to a personal shopper, who handles all of their clothing purchases and ships various items in a trunk at the customer's request. The typical trunk includes 6 to 10 items from companies such as Gant, Ben Sherman, Jack Spade, Barbour, Bonobos, and others that include items ranging from outerwear and shoes to suits and jeans, all based on the customer's individual preferences and style. The average price is $150 per item, and customers need only to text or e-mail their personal shoppers with a "send trunk" message to receive a trunk. Trunk Club pays all shipping costs (both ways), and customers pay only for the items they keep. The typical Trunk Club member, a professional man between the ages of 25 and 50 with an annual income that exceeds $100,000, keeps one-third of the items his personal shopper ships. "The apparel business is an area where there's a lot of room for innovation," says Spaly. Trunk Club recently landed an $11 million Round A investment led by venture capital firm U.S. Venture Partners and is on track to generate annual sales of $45 million.[10] ■

Entrepreneurship is the result of a disciplined, systematic process of applying creativity and innovation to needs and opportunities in the marketplace. It involves applying focused strategies to new ideas and new insights to create a product or a service that satisfies customers' needs or solves their problems. It is much more than random, disjointed tinkering with a new gadget. Millions of people come up with creative ideas for new or different products and services; most of them, however, never do anything with them. Entrepreneurs are people who connect their creative ideas with the purposeful action and structure of a business. Thus, successful entrepreneurship is a constant process that relies on creativity, innovation, and application in the marketplace.

Innovation must be a constant process because most ideas don't work and most innovations fail. One writer explains, "Trial—and lots of error—is embedded in entrepreneurship."[11] For every 5,000 to 10,000 new drug discoveries, only about 250 get to preclinical trials, and only 5 of those make it to clinical trials. Just one or two drugs emerge from clinical trials for review by the U.S. Food and Drug Administration, and only one typically gets to the market in a process that typically takes 10 to 15 years.[12] New products are crucial to companies' success, however. According to Robert Cooper, a researcher who has analyzed thousands of new product launches, new products (those launched within the previous three years) account for an impressive 38 percent of sales at top-performing companies.[13] Still, successful entrepreneurs recognize that many failures will accompany innovations, and they are willing to accept their share of failures because they know that failure is merely part of the creative process. Rather than quit when they fail, entrepreneurs simply keep trying. While working as a textbook editor, James Michener had an idea for a book based on his experiences in the Solomon Islands during World War II. He sent the manuscript to a publisher and received the following note: "You are a good editor. Don't throw it all away trying to be a writer. I read your book. Frankly, it's not really that good." Michener persisted and went on to publish *South Pacific*, for which he won a Pulitzer Prize and which became the basis for one of Broadway's most successful musicals of all time.[14]

Entrepreneurship requires business owners to be bold enough to try their new ideas, flexible enough to throw aside those that do not work, and wise enough to learn about what will work based on their observations of what did not. We now turn our attention to creativity, the creative process, and methods of enhancing creativity.

LO2

Describe why creativity and innovation are such an integral part of entrepreneurship.

Creativity—Essential to Survival

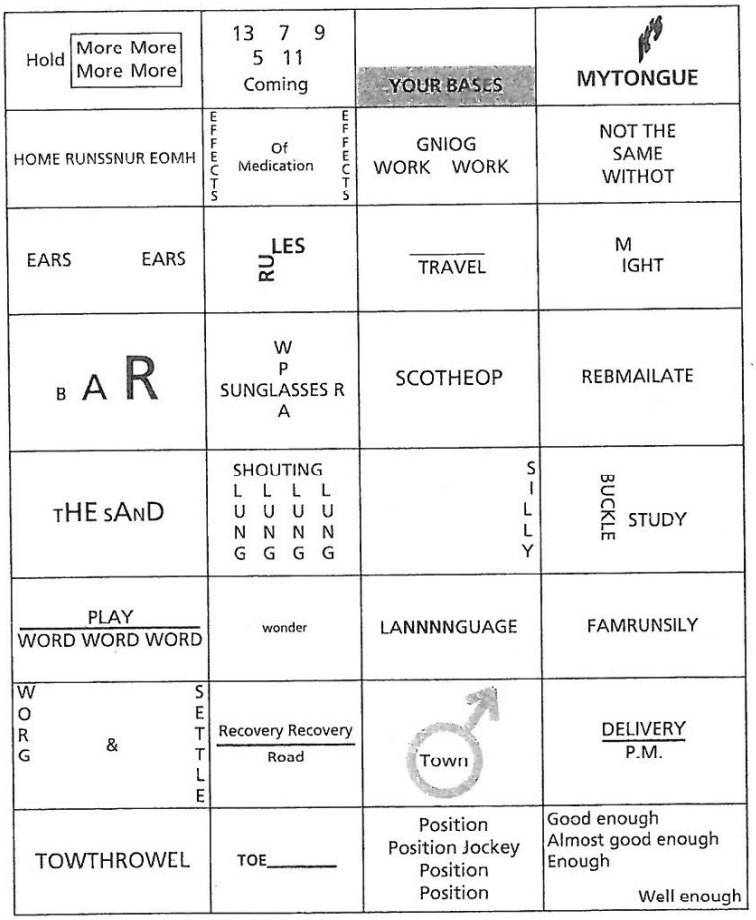
In this fiercely competitive, fast-faced, global economy, creativity is not only an important source for building a competitive advantage but also a necessity for survival. When developing creative solutions to modern problems, entrepreneurs must go beyond merely relying on what has worked in the past. "The alternatives are to 'make change' or 'be changed,'" says Langdon Morris, cofounder of InnovationLabs and an expert on innovation. "Making change brings considerable advantages, but being changed carries a huge load of negative consequences. The choice isn't really a choice at all. You've got to pursue innovation, and you've got to do it to obtain long lasting benefits."[15] Companies that fail to become engines of innovation are more likely to lose ground to their more creative competitors and ultimately become irrelevant and close their doors. Transforming their organizations into engines of innovation requires entrepreneurs to cast off the limiting assumptions, beliefs, and behaviors and to develop new insights into the relationship among resources, needs, and value. In other words, they must change their perspectives, looking at the world in new and different ways.

Entrepreneurs must always be on guard against traditional assumptions and perspectives about how things ought to be because they are certain killers of creativity. Such self-imposed mental constraints that people tend to build over time push creativity right out the door. These ideas become so deeply rooted in our minds that they become immovable blocks to creative thinking—even though they may be outdated, obsolete, and no longer relevant. In short, they act as logjams to creativity. That's why children are so creative and curious about new possibilities; society has not yet brainwashed them into an attitude of conformity, nor have they learned to accept *traditional* solutions as the *only* solutions. By retaining their creative "inner child," entrepreneurs are able to throw off the shackles on creativity and see opportunities for creating viable businesses where most people see what they've always seen (or, worse yet, see nothing). Creative exercises, such as the one in Figure 3.1, can help adults reconnect with the creativity they exhibited so readily as children.

FIGURE 3.1

How Creative Are You? Can You Recognize the Well-Known Phrases These Symbols Represent?

Sources: Terry Stickels, "Frame Games," *USA Weekend*, June 28–30, 2013, p. 14; February 24–26, 2012, p. 15; August 30–September 1, 2013, p. 11; August 23–25, 2013, p. 14; July 5–7, 2013, p. 14; July 12–14, 2013, p. 14; July 26–28, 2013, p. 14; August 16–18, 2013, p. 14; August 9–11, 2013, p. 14; June 21–23, 2013, p. 14; August 2–4, 2013, p. 14; February 3–5, 2012, p. 14; March 22–24, 2013, p. 14; July 29–31, 2011, p. 14; March 2–4, 2012, p. 14; September 9–11, 2011, p. 18; May 24–26, 2013, p. 14.



Many years ago, during an international chess competition, Frank Marshall made what has become known as one of the most beautiful—and one of the most creative—moves ever made on a chess board. In a crucial game in which he was evenly matched with a Russian master player, Marshall found his queen under serious attack. Marshall had several avenues of escape for his queen available. Knowing that the queen is one of the most important offensive players on the chessboard, spectators assumed that Marshall would make a conventional move and push his queen to safety.

Using all the time available to him to consider his options, Marshall picked up his queen—and paused—and put it down on the most *illogical* square of all—a square from which the queen could easily be captured by any one of three hostile pieces. Marshall had done the unthinkable! He had sacrificed his queen, a move typically made only under the most desperate of circumstances. All the spectators—even Marshall's opponent—groaned in dismay. Then the Russian (and finally the crowd) realized that Marshall's move was, in reality, a brilliant one. No matter how the Russian opponent took the queen, he would eventually be in a losing position. Seeing the inevitable outcome, the Russian conceded the game. Marshall had won the match in a rare and daring fashion: he had won by sacrificing his queen![16]

What lesson does this story hold for entrepreneurs? By suspending conventional thinking long enough to even consider the possibility of such a move, Marshall was able to throw off the usual assumptions constraining most chess players. He had looked beyond the traditional and orthodox strategies of the game and was willing to take the risk of trying an unusual tactic to win. The result: He won. Although not every creative business opportunity entrepreneurs take will be successful, many who, like Frank Marshall, are willing to go beyond conventional wisdom will be rewarded for their efforts. Successful entrepreneurs, those who are constantly pushing technological and economic boundaries forward, constantly ask, "Is it time to sacrifice the queen?"

Merely generating one successful creative solution to address a problem or a need usually is not good enough to keep an entrepreneurial enterprise successful in the long run, however. Success—even survival—in the modern world of business requires entrepreneurs to tap their creativity (and that of their employees) constantly. Entrepreneurs can be sure that if they have developed a unique, creative solution to solve a problem or to fill a need, a competitor (perhaps one six times zones away) is hard at work developing an even more creative solution to render theirs obsolete. This extremely rapid and accelerating rate of change has created an environment in which staying in a leadership position requires constant creativity, innovation, and entrepreneurship. A company that has achieved a leadership position in an industry but then stands still creatively is soon toppled from its number one perch.

Can Creativity Be Taught?

For many years, conventional wisdom held that a person was either creative—imaginative, free-spirited, entrepreneurial—or not—logical, narrow-minded, rigid. Today, we know better. Research shows that *anyone* can learn to be creative. "Every person can be taught techniques and behaviors that help them generate more ideas," says Joyce Wycoff, author of several books on creativity.[17] The problem is that in most organizations, employees have never been expected to be creative. In addition, many businesses fail to foster an environment that encourages creativity among employees. Restricted by their traditional thinking patterns, most people never tap into their pools of innate creativity, and the company becomes stagnant. Innovation produces a distinct competitive advantage for a company, empowers employees, and leads to higher levels of job satisfaction.

Not only can entrepreneurs and the people who work for them learn to think creatively, but they must for their companies' sake! "Innovation and creativity are not just for artists," says Wycoff. "These are skills with a direct, bottom-line payoff."[18] Before entrepreneurs can draw on their own creative capacity or stimulate creativity in their own organizations, they must understand creative thinking.

Creative Thinking

LO3

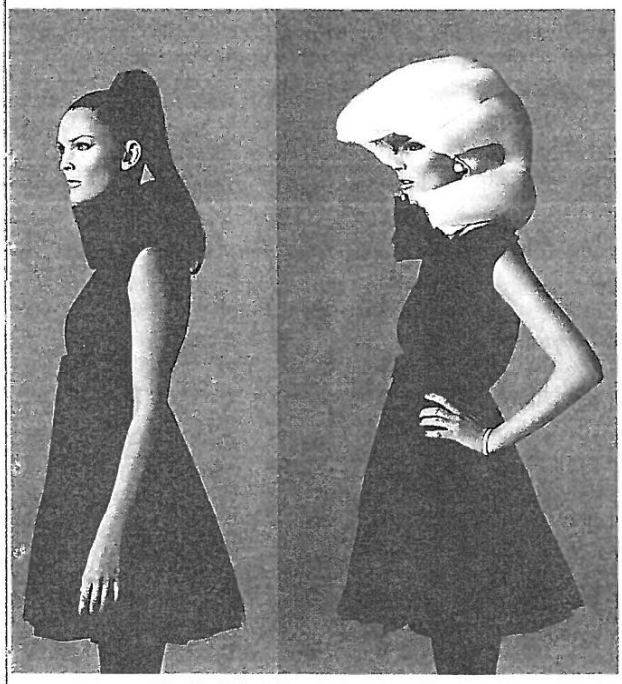
Understand how the two hemispheres of the human brain function and what role they play in creativity.

Research into the operation of the human brain shows that each hemisphere of the brain processes information differently and that one side of the brain tends to be dominant over the other. The human brain develops asymmetrically, and each hemisphere tends to specialize in certain

functions. The left brain is guided by linear, vertical thinking (from one logical conclusion to the next), whereas the right brain relies on kaleidoscopic, lateral thinking (considering a problem from all sides and jumping into it at different points). The left brain handles language, logic, and symbols; the right brain takes care of the body's emotional, intuitive, and spatial functions. The left brain processes information in a step-by-step fashion, but the right brain processes it intuitively—all at once, relying heavily on images.

Left-brain vertical thinking is narrowly focused and systematic, proceeding in a highly logical fashion from one point to the next. Right-brain lateral thinking, on the other hand, is somewhat unconventional, unsystematic, and unstructured, much like the image of a kaleidoscope, whirling around to form one pattern after another. It is this right brain–driven, lateral thinking that lies at the heart of the creative process. Those who have learned to develop their right-brain thinking skills tend to do the following:

- Always ask the question, "Is there a better way?"
- Challenge custom, routine, and tradition.
- Be reflective, often staring out windows, deep in thought. (How many traditional managers would stifle creativity by snapping these people out of their "daydreams," chastise them for "loafing," and admonish them to "get back to work"?)
- Be prolific thinkers. They know that generating lots of ideas increases the likelihood of coming up with a few highly creative ideas.
- Play mental games, trying to see an issue from different perspectives.
- Realize that there may be more than one "right answer."



Hövding/Splash News/Newscom

ENTREPRENEURIAL PROFILE: Anna Haupt and Terese Alstin: Hövding Anna Haupt and Terese Alstin, both students at Sweden's Lund University, recognized that many people incurred serious head injuries from bicycle accidents that they could have avoided if they had been wearing bicycle helmets. Their research showed that many people do not like to wear helmets because they are uncomfortable and don't look cool. The entrepreneurs believed that there was more than one solution to the bicycle helmet problem and created the Hövding Invisible Bike Helmet, which really is not a helmet at all but a collar that contains an airbag shaped like a hood. The invisible helmet uses rechargeable battery-powered accelerometers and gyroscopes that detect the motions involved in a bike crash and trigger a tiny gas inflator that fills a nylon airbag with helium in 0.1 seconds, protecting the cyclist's head from impact. Their company, Hövding, already has raised $13 million in venture capital and has 16 employees.[19] ■

- See mistakes as mere "pit stops" on the way to success.
- See problems as springboards for new ideas.

ENTREPRENEURIAL PROFILE: David Williams: Comfe Designs David Williams's idea came to him while he was reading a book that rested uncomfortably in his hands. He realized that tablet users faced the same problem and developed Comfe Hands, two soft PVC corners that fit on the corners of a tablet, giving it a shape that fits the human hand more naturally. Williams designed his first prototype that weekend, creating it out of a piece of scrap cardboard. After testing his prototypes on actual tablet users and receiving positive feedback, Williams launched Comfe Designs as a part-time business. When his job was eliminated, which he says is the best thing that ever happened to him, Williams made Comfe Designs a full-time business. Williams's company is working on designs to improve the performance of other devices, including smartphones, sound systems, and television monitors. The company's strategy is

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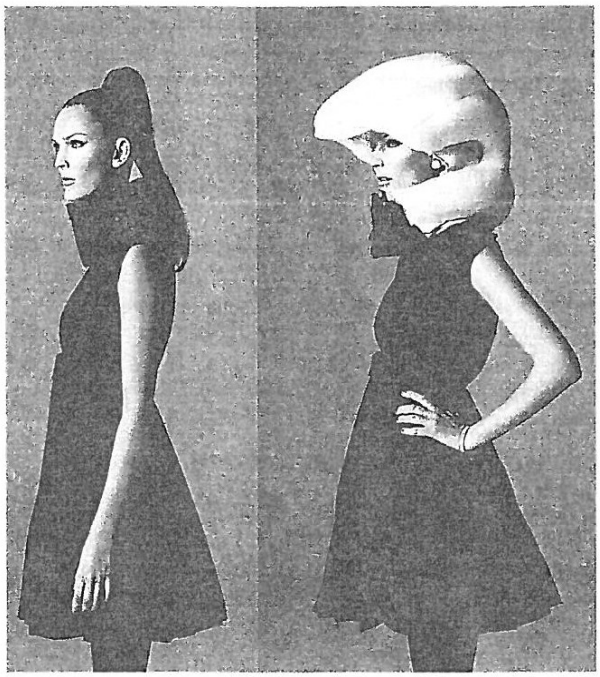

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to identify problems with existing products and to create a solution that improves customers' interaction with that product.[20] ■

- Understand that failure is a natural part of the creative process. James Dyson spent 15 years and nearly his entire savings before he succeeded in developing the bagless vacuum cleaner that made him rich and famous. To discover something truly new, Dyson says, one must make mistakes because success teaches very few lessons.
- Have "helicopter skills," the ability to rise above the daily routine to see an issue from a broader perspective and then swoop back down to focus on an area in need of change.
- Relate seemingly unrelated ideas to a problem to generate innovative solutions.

ENTREPRENEURIAL PROFILE: Charles Kaman: Kaman Aircraft Company and Ovation Instruments After graduating from college, Charles Kaman worked in the helicopter division of United Aircraft Corporation, where he helped to design helicopters for the military. Using a homemade calculator he called the Aeronalyzer, Kaman developed several innovations in rotor and wing designs, in none of which his employer showed any interest. In 1945, with $2,000 and his idea for a new dual rotor system that made helicopters more stable and safer to fly, 26-year-old Kaman, also an accomplished guitarist, turned down an offer to join Tommy Dorsey's famous swing band and decided to pursue his innovative designs for helicopters. He started the Kaman Aircraft Company in his mother's garage. Over the next 50 years, Kaman built his company into a billion-dollar aviation business, creating many important innovations along the way, including turbine engines, blades made of lightweight, sturdy composite materials, and remote-controlled helicopters. Kaman also maintained an avid interest in guitars and in 1964 began working with a small team of aerospace engineers to build a better acoustic guitar. Drawing on their experience of removing vibrations from helicopters, the team reverse-engineered a guitar with a bowl-shaped body made of composite materials that incorporated more vibration into the instrument, giving it a bolder, richer sound. "In helicopters, engineers spend all of their time trying to figure out how to remove vibration," Kaman said. "To build a guitar, you spend your time trying to figure out how to put vibration in." Kaman founded Ovation Instruments in 1966 and began selling the Balladeer, an acoustical guitar that immediately attracted attention for its superior tone and volume among musicians, including famous artists such as John Lennon, Glen Campbell, Bob Marley, Carly Simon, Jimmy Page, and Melissa Etheridge.[21] ■

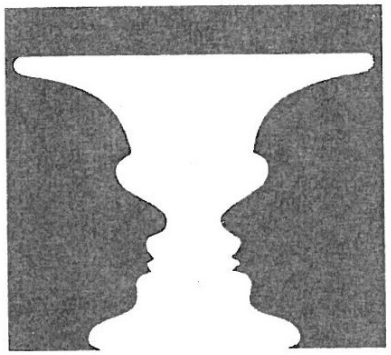
Although each hemisphere of the brain tends to dominate in its particular functions, the two halves normally cooperate, with each part contributing its special abilities to accomplish those tasks best suited to its mode of information processing. Sometimes, however, the two hemispheres may even compete with each other, or one half may choose not to participate. Some researchers have suggested that each half of the brain has the capacity to keep information from the other! The result, literally, is that "the left hand doesn't know what the right hand is doing." Perhaps the most important characteristic of this split-brain phenomenon is that an individual can learn to control which side of the brain is dominant in a given situation. In other words, a person can learn to "turn down" the dominant left hemisphere (focusing on logic and linear thinking) and "turn up" the right hemisphere (focusing on intuition and unstructured thinking) when a situation requiring creativity arises.[22] To get a little practice at this "shift," try the visual exercises presented in Figure 3.2. When viewed from one perspective, the picture B on the right portrays an attractive young lady with a feather in her hair and a boa around her shoulders. Once you shift your perspective, however, you will see an old woman with a large nose wearing a scarf on her head! This change in the image seen is the result of a shift from one hemisphere in the viewer's brain to the other. With practice, a person can learn to control this mental shift, tapping the pool of creativity that lies hidden within the right side of the brain. This ability has tremendous power to unleash the creative capacity of entrepreneurs. The need to develop this creative ability means that exploring inner space (the space within our brains)—not outer space—becomes the challenge of the century.

FIGURE 3.2

What Do You See?

In panel A, do you see the vase or the twins?
In panel B, do you see the old woman with a scarf on her head or the young woman looking away?
In panel C, do you see the face of Jesus?

Sources: Thomas W. Zimmerer and Norman M. Scarborough, *Entrepreneurship and New Venture Formation.* © 1995. Reprinted by permission of Prentice Hall, Inc., Upper Saddle River, NJ.



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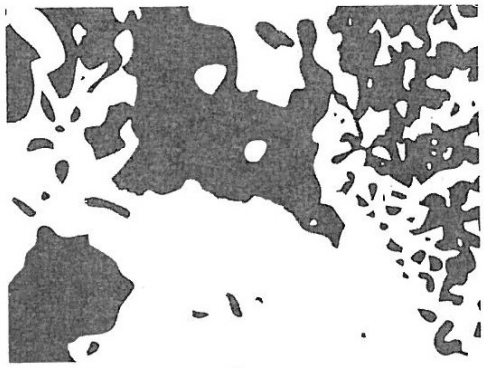

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Successful entrepreneurship requires both left- and right-brain thinking. Right-brain thinking draws on the power of divergent reasoning, which is the ability to create a multitude of original, diverse ideas. Left-brain thinking counts on convergent reasoning, the ability to evaluate multiple ideas and choose the best solution to a given problem. Entrepreneurs need to rely on right-brain thinking to generate innovative product, service, or business ideas. Then they must use left-brain thinking to judge the market potential of the ideas they generate. Successful entrepreneurs have learned to coordinate the complementary functions of each hemisphere of the brain, using their brains' full creative power to produce pragmatic innovation. Otherwise, entrepreneurs, who rarely can be accused of being "halfhearted" about their business ideas, run the risk of becoming "halfheaded."

How can entrepreneurs learn to tap their innate creativity more readily? The first step is to break down the barriers to creativity that most of us have erected over the years. We now turn our attention to these barriers and some suggested techniques for tearing them down.

LO4

Explain the 10 "mental locks" that limit individual creativity.

Barriers to Creativity

The number of potential barriers to creativity is virtually limitless—time pressures, unsupportive management, pessimistic coworkers, overly rigid company policies, and countless others. Perhaps the most difficult hurdles to overcome, however, are those that individuals impose on themselves. In his book *A Whack on the Side of the Head*, Roger von Oech identifies 10 "mental locks" that limit individual creativity:[23]

1. *Searching for the one "right" answer.* Recent research by Kyung Hee Kim, a professor at the College of William & Mary, shows that creativity (as measured by the Torrance Test of Creative Thinking) among both children and adults in the United States has declined markedly since 1990. The decline, which Kim says is "very significant," is particularly acute among the youngest segment of the population, children from kindergarten to

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10 Keys to Business Innovation

Creativity expert Teresa Amabile identifies three components of creativity: (1) **Expertise**. One must have the technical, procedural, and conceptual knowledge to generate potential solutions to a problem. (2) **Creative thinking skills.** A person must possess the willingness to take risks and to see problems or situations from different perspectives, using many of the techniques described in this chapter. (3) **Motivation**. One must have the internal desire to develop creative solutions. This motivation often comes from the challenge that the work itself presents.

Entrepreneurs and their employees can transform their companies into engines of innovation by combining these three components of creativity with what management consultant The Doblin Group calls the 10 types of innovation.

1. ***Business model.*** How does your company make money? These are innovations in the value proposition that a company provides its target customers and in the way it delivers value to its customers.
2. ***Networks and alliances.*** Can you join forces with another company or entity for mutual benefit? A company may forge a synergistic relationship with another organization in which each company's strengths complement the other.
3. ***Organizational structure.*** How do you support and encourage your employees' creative efforts? The most effective organizations use an appropriate structure and culture to align their talent to spark innovation.
4. ***Core process.*** How does your company create and add value for customers? These innovations in a company's internal processes result in superior business systems and work methods that result in benefits for customers.
5. ***Product or service performance.*** What are the most important features and functions of your company's products or services? Innovations in functions and features can give a company's product or service a significant edge over those of competitors.
6. ***Product system.*** Can you link multiple products into a system or a platform? Bundling products can add value for customers.
7. ***Service.*** How do you provide value-added service beyond your company's products for customers? Some of the most successful businesses set themselves apart from their competition by providing unparalleled customer service.
8. ***Channel.*** How do you get your products or services into customers' hands? Some companies provide extra value to their customers by making their products and services available in many venues.
9. ***Brand.*** What is your company's "identity" in the marketplace? Successful companies use creative advertising, promotion, and marketing techniques to build a desirable brand identity with customers.
10. ***Customer experience.*** Does your company engage customers and give them reasons to come back to make future purchases? Innovative companies find ways to connect with their customers, creating a loyal base of "fansumers," customers who not only purchase but act like fans who promote the company to their friends and family members.

Boatbound

Serial entrepreneur Aaron Hall took note of the "sharing economy" that emerged during the last recession and launched Boatbound, a peer-to-peer boat rental company that brings together boat owners who are willing to rent their boats when they are not in use and people who want a fun boating experience without the cost of owning a boat. Hall realized that 12.2 million boats are registered in the United States, yet the average owner uses his or her boat just 26 days per year. Boatbound screens all potential renters, verifies the condition and the safety of each boat, carries ample insurance on each boat, and covers general liability. Boat owners select their renters from Boatbound's pool of applicants and set daily rental fees, and Boatbound collects 35 percent of the fee. Boatbound has rented every kind of boat, from kayaks to yachts with captains. Fees range from $200 to $8,500 per day. "As a boat owner and someone in the marine industry, I've been waiting for something like this my whole life," says Aabad Melwani, owner of a marina. "I just didn't know it."

Henrybuilt

Scott Hudson, CEO of Henrybuilt, had created a profitable niche designing and building upscale kitchens that ranged from $30,000 to $100,000. In 2006, Hudson opened a New York City showroom, which doubled in size in just 18 months. By 2008, the company had more than 200 jobs in the United States, Mexico, and Canada. When the recession hit, however, new projects came to a standstill, and customers began cancelling orders. In response, Hudson launched a subsidiary, Viola Park Corporation, that provides customers lower-cost remodeling options that use its software rather than an architect to create "custom" variations on Henrybuilt designs. The result is a process that produces a kitchen much faster and at half the cost of a Henrybuilt kitchen. Henrybuilt sales have recovered, but Viola Park accounts for 20 percent of sales and is growing twice as fast as Henrybuilt.

Unequal Technologies

Robert Vito started Unequal Technologies in 2008 to supply protective clothing and gear, including bullet-proof vests, to military contractors. The protective gear is made from a lightweight yet strong composite material that he developed and patented. Two years later, the equipment manager of the Philadelphia Eagles called to ask whether Unequal Technologies could create a special garment for one of its star players who had suffered a sternum injury. Vito modified the bullet-proof vest for the player and soon had other players in the National Football League asking for protective gear. Unequal technologies went on to develop Concussion Reduction Technology (CRT), peel-and-stick pads for football helmets that are made from

(continued)

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the composite and that absorb and disperse the force of an impact before it reaches the skull. Independent tests show that CRT reduces the risk of head injuries from impact by 53 percent. The company now supplies equipment to 27 of the NFL's 32 teams and has its sights set on an even larger market: amateur sports. Vito says Unequal's technology gives the company a competitive edge that has allowed it to increase sales from $1 million to $20 million in just one year.

1. Select one of these businesses and explain which of the 10 types of innovation the company used to bolster its success.
2. Explain how the company you selected in question 1 could use at least one of the remaining types of innovation to increase its sales and profitability.

Sources: Based on Teresa M. Amabile, "Componential Theory of Creativity," Harvard Business School, Working Paper 12-096, April 26, 2012, pp. 2–3; Robert F. Brands, "Stay Inspired This Holiday Season: The 12 Days of Innovation," *Huffington Post*, December 20, 2012, http://www.huffingtonpost.com/robert-f-brands/stay-inspired-holiday-season_b_2334305.html; Paul Davis, "Innovation White Paper," Scanlon Leadership Network, January 2008, p. 3; Nancy Dahlberg, "Making Waves in 'the Sharing Economy': Peer-to-Peer Rental Companies Arrive in South Florida," *Miami Herald*, September 15, 2013, http://www.miamiherald.com/2013/09/15/3626239/making-waves.html; Sarah E. Needleman, Vanessa O'Connell, Emily Maltby, and Angus Loten, "And the Most Innovative Entrepreneur Is . . ." *Wall Street Journal*, November 14, 2011, pp. R1, R4; April Joyner, "Unequal Technologies," *Inc.*, February 2013, p. 26; Suzanne Barlyn, "New and Improved," *Wall Street Journal*, April 23, 2009, http://online.wsj.com/article/SB124025160159735869.html; Kelly Spors, "Tough Times Call for New Ideas," *Wall Street Journal*, February 15, 2009, http://online.wsj.com/article/SB123466563957289181.html; and Gene Marks, "Why Most Small Businesses Will Beat the Recession," *Bloomberg Business Week*, January 8, 2009, http://www.businessweek.com/smallbiz/content/jan2009/sb2009015_212410.htm.

sixth grade.[24] Part of the problem is that deeply ingrained in most educational systems is the assumption that there is one "right" answer to a problem. In reality, however, most problems are ambiguous. The average student who has completed four years of college has taken more than 2,600 tests; therefore, it is not unusual for this one-correct-answer syndrome to become an inherent part of our thinking. Although everyone has the capacity to be creative, not everyone develops that capacity. Most education systems do not do much to encourage creativity among students; instead, they promote uniformity and standardization. People who go through many years of schooling often come out on the other side drained of their creative potential and focused on conformity rather than on creativity.

Depending on the questions one asks, there may be (and usually are) several "right" answers.

Sam Gangwer/SUMAPRESS/Newscom

ENTREPRENEURIAL PROFILE: Jason Lucash and Mike Szymczak: OrigAudio Jason Lucash and Mike Szymczak grew tired of hauling bulky audio players as part of their jobs with JanSport, a maker of sports, travel, business, and tote bags, and began experimenting with designs for pop-up speakers. (Their early experiments involved putting speakers into Chinese food takeout boxes.) With $10,000 in seed money from Lucash's mother, the entrepreneurs launched OrigAudio (a mash-up of "origami" and "audio") and introduced their first product: speakers made from recycled material that come flat and fold together. "The Chinese takeout box concept inspired us," says Lucash, "but origami is what empowered us." Sales took off quickly, and Lucash and Szymczak left their jobs to manage OrigAudio full time. OrigAudio now has 14 employees and generates $4 million in annual sales from nine products, including the Rock-It, a small, simple device that turns almost anything—a cooler, a cup, a bowl, a box, a painting, a lampshade—into a speaker.[25] ■

2. *Focusing on "being logical."* Logic is a valuable part of the creative process, especially when evaluating ideas and implementing them. However, in the early imaginative phases of the process, logical thinking can restrict creativity. Focusing too much effort on being logical also discourages the use of one of the mind's most powerful creations: intuition. Von Oech advises us to "think something different" and to use nonlogical thinking freely, especially in the imaginative phase of the creative process. Intuition, which is based on the accumulated knowledge and experiences a person encounters over the course of a lifetime and which resides in the subconscious, can be unlocked. It is a crucial part of the

creative process because using it often requires one to tear down long-standing assumptions that limit creativity and innovation.

ENTREPRENEURIAL PROFILE: Chuck Swoboda: Cree, Inc. Chuck Swoboda, CEO of Cree, Inc., a lighting manufacturer based in Durham, North Carolina, realized that the design of the light bulb had remained virtually unchanged in the 130 years since Thomas Edison invented it. Cree, founded in 1987, produced highly efficient, long-lasting LED lights, but LEDs suffer from one problem: They emit light in only one direction, which makes them poor substitutes for traditional incandescent and fluorescent bulbs, which produce omnidirectional light for broad coverage. Designers at the innovative company redesigned the traditional filament towers (the heart of a bulb) to include up to 20 small LED bulbs of different colors aligned at different (and overlapping) angles that create an omnidirectional glow that mimics the light from an incandescent bulb. When Cree made an initial public offering in 1993, the company had just 30 employees; today, its workforce exceeds 6,000.[26] ■

3. *Blindly following the rules.* We learn at a very early age not to "color outside the lines," and we spend the rest of our lives blindly obeying such rules. Sometimes, creativity depends on our ability to break the existing rules so that we can see new ways of doing things. "Most people's minds are not wired to go against what everybody else is doing," observes neuroscientist Gregory Berns. "When you look at problems, you tend to perceive them in well-worn paths in ways that you've perceived them before. That's the first roadblock in innovating: overcoming your perceptual biases."[27]

ENTREPRENEURIAL PROFILE: King Gillette: Gillette Safety Razor Company In 1895, King Gillette, a traveling salesman who aspired to be an entrepreneur, was shaving with a straight razor, the standard technology of the day, when a creative idea struck him: a "safety razor" that consisted of a small, thin square of sheet steel held in place by a holder equipped with a handle. When a blade became dull, the user would simply replace it. "I saw it all in a moment," Gillette said. "The way the blade would be held in a holder. Then came the idea of sharpening the two opposite edges of a thin piece of steel, and then came the clamping plates for the blades, with a handle centered between the edges. I stood there in a trance of joy." Gillette visited metallurgists at the nearby Massachusetts Institute of Technology, who assured him that it would be *impossible* to produce steel that was thin enough, sharp enough, and inexpensive enough to produce blades for his safety razor. After six years of work, however, two business associates introduced the determined Gillette to William Nickerson, an MIT graduate who produced the blade that Gillette had designed. Gillette received patent number 775,134 for his safety razor from the U.S. Patent and Trademark Office in 1904. The American Safety Razor Company, which later became Gillette Safety Razor Company, began producing blades in Boston in 1903, and the world of shaving was transformed forever because Gillette was willing to question the established "rules" of shaving. Procter and Gamble purchased Gillette in 2005 for $57 billion.[28] ■

4. *Constantly being practical.* Imagining impractical answers to "what-if" questions can be powerful stepping stones to creative ideas. Suspending practicality for a while frees the mind to consider creative solutions that otherwise might never arise. Whenever Thomas Edison hired an assistant to work in his creative laboratory, he would tell the new employee to walk through town and list 20 things that interest him. When the worker returned, Edison would ask him to split the list into two columns. Then he would tell the employee to randomly combine objects from the two columns to come up with as many inventions as he could. Edison's methods for stimulating creativity in his lab proved to be successful; he holds the distinction of being the only person to have earned a patent every year for 65 consecutive years![29]

   Periodically setting aside practicality allows entrepreneurs to consider taking a product or a concept from one area and placing it in a totally different application.

ENTREPRENEURIAL PROFILE: GEWOS Chair Researchers at Germany's Fraunhofer Institute for Integrated Circuits threw out practical assumptions when they created an armchair that converts into a rowing machine. Their goal was to develop a device that allows

the elderly or the disabled to get fit without having to leave the comfort of their living rooms. The GEWOS (the acronym for the German phrase that translates "Healthy Living with Style") chair, which took three-and-a-half years to develop, features armrests that raise to reveal rowing handles and built-in sensors that monitor the seated person's heart rate, blood pressure, and oxygen saturation levels. Sensors also indicate whether the user is sitting in the proper posture to avoid back injuries. An accompanying tablet includes a virtual fitness assistant that analyzes a user's data over time and recommends customized exercise plans. When not in use as a rowing machine, the chair looks like any other comfortable armchair. Early tests with senior citizens indicate that the GEWOS chair is a big hit.[30] ■

Splash News/Newscom

5. *Viewing play as frivolous.* A playful attitude is fundamental to creative thinking. There is a close relationship between the "haha" of humor and the "aha" of discovery. Play gives us the opportunity to reinvent reality and to reformulate established ways of doing things. Children learn when they play, and so can entrepreneurs. Watch children playing, and you will see them invent new games, create new ways of looking at old things, and learn what works (and what doesn't) in their games.

   Entrepreneurs can benefit from playing in the same way that children do. They, too, can learn to try new approaches and discover what works and what doesn't. Creativity results when entrepreneurs take what they have learned at play, evaluate it, corroborate it with other knowledge, and put it into practice. Zappos, the online shoe retailer that makes regular appearances on *Fortune's* Best Places to Work list, includes "create fun and a little weirdness" as one of its core values. "Our company culture is what makes us successful," says CEO Tony Hsieh. "We want to be able to laugh at ourselves. We look for both fun and humor in our daily work."[31] Encouraging employees to have fun when solving problems means that they are more likely to push the boundaries and come up with genuinely creative solutions. What kind of invention would Wile E. Coyote, who seems to have an inexhaustible supply of ideas for catching the Roadrunner in those cartoons, create in this situation? How might the Three Stooges approach this problem? What would Kramer of *Seinfeld* suggest? What solution would Si from *Duck Dynasty* offer? What would a six-year-old do? The idea is to look at a problem or situation from different perspectives.

ENTREPRENEURIAL PROFILE: Stu Snyder: Cartoon Network PlayWorks, an organization dedicated to promoting the creative power of play, recently named Stu Snyder, CEO of the Cartoon Network, as the Most Playful CEO in the country. Employees are likely to see Stu riding his oversized tricycle around company headquarters or hear him ring a gong to celebrate a worker's or team's accomplishment, which is followed by cheers and hoots of laughter from employees. "I'm a believer of leading by play," says Snyder. "We're all teammates. Playing, having fun, and laughing together help us enjoy our jobs and improve our work ethic." Snyder also recognizes the power of play to unleash people's creative spirit. "Stu's playful leadership allows employees to be more creative and to take the risk to go full force with their creative ideas," says one employee.[32] ■

myopic thinking
a type of thinking that destroys creativity because it is narrowly focused and limited by the status quo.

6. *Becoming overly specialized.* A common killer of creativity is **myopic thinking**, which is narrowly focused and limited by the status quo. Because experts are so immersed in what they know, they often are victims of myopic thinking. That's why creative companies include *non-experts* in creative problem solving or idea generation sessions; they are free to ask questions and offer ideas that challenge the status quo and traditional solutions that experts "know" cannot work but often do. Creative thinkers tend to be "explorers," searching for ideas outside their areas of specialty. The idea for the roll-on deodorant stick came from the ballpoint pen. The famous Mr. Potato Head toy was invented by a father sitting with his family at the dinner table who noted how much fun his children had playing with

their food. Velcro (a combination of "velvet" and "crochet") was invented by Swiss engineer Georges de Mestral, who, while hiking one day in 1941 to take a break from work, had to stop to peel sticky cockleburs from his clothing. As he picked them off, he noticed how their hooked spines caught on and held tightly to the cloth. When he resumed his hike, he began to think about the possibilities of using a similar design to fasten objects together. After eight years of research and work, Mestral perfected his design for Velcro, which he patented in 1955.[33]

ENTREPRENEURIAL PROFILE: Lynn Perkins, Daisy Downs, Andrea Barrett, and Hadar Wissotzky: UrbanSitter Late in 2010, Lynn Perkins, a mother of twin boys and founder of online clothing company Xuny, was having trouble finding a babysitter, a problem that she and many of her friends encountered often. She wondered why she could book an online restaurant reservation so easily, yet had to spend hours sometimes making phone calls and sending e-mails to find a babysitter. Perkins knew that there had to be a better way and, drawing inspiration from the online restaurant booking service OpenTable, convinced three friends, Daisy Downs, Andrea Barrett, and Hadar Wissotzky, to launch UrbanSitter, a San Francisco-based company that uses Facebook to connect parents and babysitters. Tapping (with permission) into Facebook contacts, groups, and likes, UrbanSitter's software identifies potential babysitters and generates a list that enables parents to review rates, conduct background checks, schedule interviews, and book sitters online. The service also allows parents to see which babysitters their friends have used and reviewed, which, Perkins points out, puts parents' minds at ease when bringing in someone for the first time to care for their children. Just six months after launching UrbanSitter, Perkins and her cofounders expanded the service to New York City, Chicago, Denver, Seattle, St, Louis, and Lake Tahoe/Reno, Nevada.[34] ■

Courtesy of UrbanSitter

7. *Avoiding ambiguity.* Ambiguity can be a powerful creative stimulus; it encourages us to "think something different." Being excessively detailed in an imaginative situation tends to stifle creativity. Ambiguity, however, requires us to consider at least two different, often contradictory notions at the same time, which is a direct channel to creativity. Ambiguous situations force us to stretch our minds beyond their normal boundaries and to consider creative options we might otherwise ignore. Although ambiguity is not a desired element when entrepreneurs are evaluating and implementing ideas, it is a valuable tool when they are searching for creative ideas and solutions. Entrepreneurs are famous for asking a question and then going beyond the first answer to explore other possible answers. The result is that they often find business opportunities by creating ambiguous situations.

8. *Fearing looking foolish.* Creative thinking is no place for conformity! New ideas rarely are born in a conforming environment. People tend toward conformity because they don't want to look foolish. The fool's job is to whack at the habits and rules that keep us thinking in the same old ways. In that sense, entrepreneurs are top-notch "fools." They are constantly questioning and challenging accepted ways of doing things and the assumptions that go with them. The noted entrepreneurship theorist Joseph Schumpeter wrote that entrepreneurs perform a vital function—"creative destruction"—in which they rethink conventional assumptions and discard those that are no longer useful. According to Schumpeter, "The function of entrepreneurs is to reform or revolutionize the pattern of production by exploiting an invention or, more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way, by opening up a new source of supply of materials or a new outlet for products, by reorganizing an industry or so on."[35] In short, entrepreneurs look at old ways of doing things and ask, "Is there a better way?" By destroying the old, they create the new.

ENTREPRENEURIAL PROFILE: Neurowear: Mico Headphones Neurowear, a company based in Tokyo, Japan, has developed technology that makes creating a playlists on your smartphone or MP3 player unnecessary. The company's Mico headphones include sensors that monitor the user's brain activity (different patterns in the prefrontal cortex indicate different moods) to select the appropriate type of music. Neurowear says that Mico headphones provide "music inspiration from your subconscious." Tense? Mico will select a soothing ballad or a piece of classical music from your player to relax you. Drowsy? The headphones will select an upbeat, energetic tune to get you moving.[36] ■

9. *Fearing mistakes and failure.* Creative people realize that trying something new often leads to failure; however, they do not see failure as an end. It represents a learning experience on the way to success. As you learned in Chapter 1, failure is an important part of the creative process; it signals entrepreneurs when to change their course of action. Entrepreneurship is all about the opportunity to fail! Many entrepreneurs failed numerous times before finally succeeding. Despite their initial setbacks, they were able to set aside the fear of failure and keep trying.

ENTREPRENEURIAL PROFILE: Arianna Huffington: Huffington Post Arianna Huffington, author of a dozen books and founder of the news and blog Web site Huffington Post, says, "I love talking about my failures more than my successes. Think of failure as a stepping-stone to success. I was rejected by 35 publishers before getting to yes." The highly successful Huffington Post, which Huffington launched in 2005, attracts more than 50 million unique visitors per month, more than the Web sites of any major newspaper in the United States.[37] ■

The key is to see failure for what it really is: a chance to learn how to succeed. Entrepreneurs who willingly risk failure and learn from it when it occurs have the best chance of succeeding at whatever they try. Charles F. Kettering, a famous inventor (he invented the lighting and ignition systems in automobiles, among other things), explains, "You fail because your ideas aren't right, but you should learn to fail intelligently. When you fail, find out *why* you failed and each time it will bring you nearer to the goal."[38] Successful entrepreneurs equate failure with innovation rather than with defeat.

Thanks to technology, the cost of failed attempts at innovation has never been lower. Entrepreneurs and companies can test new ideas at speeds and costs that were unimaginable only a few years ago. Building prototypes, getting them into potential customers' hands, and getting useful feedback on them has never been easier and less expensive. Entrepreneurs use the Internet and social media to test their business models and determine whether customers are interested in purchasing their product and service innovations.

10. *Believing that "I'm not creative."* Some people limit themselves because they believe that creativity belongs only to the Einsteins, Beethovens, and da Vincis of the world. Unfortunately, this belief often becomes a self-fulfilling prophecy. A person who believes that he or she is not creative will, in all likelihood, behave that way and will make that belief come true. Some people who are considered geniuses, visionaries, and inventors actually are no smarter and have no more innate creative ability than the average person; however, they have learned how to think creatively and are persistent enough to keep trying until they succeed.

Successful entrepreneurs recognize that "I'm not creative" is merely an excuse for inaction. *Everyone* has within him or her the potential to be creative; not everyone will tap that potential, however. Successful entrepreneurs find a way to unleash their creative powers on problems and opportunities.

By avoiding these 10 mental locks, entrepreneurs can unleash their own creativity and the creativity of those around them as well. Successful entrepreneurs are willing to take some risks, explore new ideas, play a little, ask "What if?" and learn to appreciate ambiguity. By doing so,

TABLE 3.1 Questions to Spur the Imagination

We learn at an early age to pursue answers to questions. Creative people, however, understand that *good questions* are extremely valuable in the quest for creativity. Some of the greatest breakthroughs in history came as a result of creative people asking thought-provoking questions. Bill Bowerman, contemplating a design for the soles of running shoes over a breakfast of waffles, asked, "What would happen if I poured rubber into my waffle iron?" He did, and that's how Nike shoes came to be. (Bowerman's rubber-coated waffle iron is on display in the Nike Town superstore and museum in Chicago.) Albert Einstein, creator of the theory of relativity, asked, "What would a light wave look like to someone keeping pace with it?"

To jump-start creativity, Steve Gillman suggests writing a short list of adjectives, such as *light, cheap, fast, big, short, small,* and *fun*, and using them to ask what-if questions. What if this product could be lighter? What if this process could be faster? What if this service could be cheaper?

The following questions can help spur your imagination:

1. Is there a new way to do it?
2. Can you borrow or adapt it?
3. Can you give it a new twist?
4. Do you merely need more of the same?
5. Less of the same?
6. Is there a substitute?
7. Can you rearrange the parts?
8. What if you do just the opposite?
9. Can you combine ideas?
10. Are customers using your product or service in ways you never expected or intended?
11. Which customers are you not serving? What changes to your product or service are necessary to reach them?
12. Can you put it to other uses?
13. What else could we make from this?
14. Are there other markets for it?
15. Can you reverse it?
16. Can you rearrange it?
17. Can you put it to another use?
18. What idea seems impossible but, if executed, would revolutionize your business?

Bob Purcell, CEO of Protean Electric, based in Auburn Hills, Michigan, asked a simple but profound question: "What if we could convert *any* vehicle into a hybrid?" That question led the employees at the company to develop the Protean Drive Motor, a 68-pound motor that installs directly onto an existing vehicle's wheels and converts them to direct-drive, which eliminates the need for a transmission. Because the Protean Drive Motor contains a power inverter, electronics, and software to drive the system and costs between $1,500 and $1,800, it can be easily integrated into most existing vehicles, converting them to hybrid electric or pure electric vehicles without adding significant weight or cost. A lithium-ion battery pack installed beneath the car's trunk and the car's engine power the drive motors. The sophisticated system also funnels to the drive motors up to 85 percent of the kinetic energy it captures when the car brakes. Studies show that equipping a car with two drive motors adds 220 horsepower and improves its fuel efficiency by 30 percent. Protean Electric recently landed $84 million in venture capital to finance the construction of a factory in Liyang, China, and is working with several automakers around the world to implement its fuel-saving technology. Protean has received 27 patents for its technology and designs.

Sources: Based on Chuck Frey, "How to Develop a Powerful Arsenal of Creative Questions," *Innovation Tools*, March 1, 2011, http://www.innovationtools.com/weblog/innovationblog-detail.asp?ArticleID=1570; David Lidsky, "Brain Calisthenics," *Fast Company*, December 2004, p. 95; Thea Singer, Christopher Caggiano, Ilan Mochari, and Tahl Raz, "If You Come, They Will Build It," *Inc.*, August 2002, p. 70; Creativity Web, "Question Summary," http://www.ozemail.com/au/~caveman/Creative/Techniques/osb_quest.html; *Bits & Pieces*, February 1990, p. 20; *Bits & Pieces*, April 29, 1993; "Creativity Quiz," *In Business*, November/December 1991, p. 18; Doug Hall, *Jump Start Your Brain* (New York: Warner Books, 1995), pp. 86–87; Christine Canabou, "Imagine That," *Fast Company*, January 2001, p. 56; Steve Gillman, "Step Out of Business Mode to Solve Problems," *Regan's Manager's eBulletin*, May 22, 2008, p. 1; Nicole Dyer, "Innovation," *Inc.*, October 12, 2012, pp. 38–39; Angus MacKenzie, "Smack Torque: Protean Electric Launches New In-Wheel Drive System," *GizMag*, April 17, 2013, http://www.gizmag.com/protean-electric-unveils-in-wheel-electric-drive-system-for-hybrids-and-evs/27110/.

they develop the skills, attitudes, and motivation that make them much more creative—one of the keys to entrepreneurial success. Table 3.1 lists some questions designed to spur imagination.

How to Enhance Creativity

LO5

Understand how entrepreneurs can enhance the creativity of their employees as well as their own creativity.

Enhancing Organizational Creativity

Creativity doesn't just happen in organizations; entrepreneurs must establish an environment in which creativity can flourish—for themselves and for their workers. "Everyone has a creative spark, but many factors can inhibit its ignition," says one writer. "Part of an [entrepreneur's] role is to see

the spark in his or her people, encourage its ignition, and champion its success."[39] New ideas are fragile creations, but the right company culture can encourage people to develop and cultivate them. Ensuring that workers have the freedom and the incentive to be creative is one of the best ways to achieve innovation. Entrepreneurs can stimulate their own creativity and encourage it among workers by following these suggestions, which are designed to create a culture of innovation.

INCLUDE CREATIVITY AS A CORE COMPANY VALUE AND MAKE IT AN INTEGRAL PART OF THE COMPANY'S CULTURE Innovative companies do not take a passive approach to creativity; they are proactive in their search for new ideas. One of the best ways to set a creative tone throughout an organization begins with the company's mission statement. Entrepreneurs should incorporate creativity and innovation into their companies' mission statements and affirm their commitment to them in internal communications. Bell Labs, a predecessor to the high-tech companies of Silicon Valley, was the birthplace of some of the world's greatest inventions, including the semiconductor chip, optical fiber, communication satellites, C programming language, and many others, from the 1920s to the 1960s. For most of those years, Mervin Kelly, a former researcher, led the company with his vision of establishing an "institute of creative technology" that fostered "a busy exchange of ideas." Employees at Bell Labs understood that their mission was to transform new knowledge into transformational products that the company could commercialize.[40] As Bell Labs proved, innovation allows a company to shape, transform, and create its future, and the starting point for defining that future is in the mission statement. If creativity and innovation are vital to a company's success (and they usually are!), they also should be a natural part of the performance appraisal process.

Innovation can be a particularly powerful competitive weapon in industries that are resistant to change and are populated by companies that cling to the same old ways of doing business. Even small companies that are willing to innovate can have a significant impact on entire industries by shaking up the status quo with their creative approaches. The result often is growing market share and impressive profits for the innovator.

ENTREPRENEURIAL PROFILE: T. J. Scimone: Slice T. J. Scimone, founder of Slice, a product design firm in Campbell, California, originally intended to improve the design of kitchen and houseware products when he launched his company in 2008. However, after Scimone came up with a better idea for a safer, more effective ceramic blade for opening shrink-wrapped packages that became his company's best-selling item, he decided to focus his efforts on redesigning common tools such as box cutters and scissors. Scimone noted that box cutters were unsafe, antiquated tools and set out to make them safer, more functional, and more aesthetically pleasing. His company's Slice box cutter features a nonslip handle with a wrap-around protective housing that serves as a natural shield for the user's hand and that exposes only half of the double-sided ceramic blade, which lasts up to 10 times longer than steel blades. The slim, comfortable design gives users so much control that they can carve out intricate shapes with surgical accuracy. The keys to the success of Slice's box cutter, which has won numerous design awards, and its other products are simplicity and functionality. "We look for simple, incremental twists to existing products," says Scott Herbst, the company's director of industrial design.[41] ■

HIRE FOR CREATIVITY Research published in the *Sloan Management Review* concludes that the most effective way for companies to achieve continuous innovation over the long term is by hiring and cultivating talented people.[42] Figure 3.3 shows the results of a survey of the CEOs of *Inc.*'s 500 fastest growing companies about the factors that are most important to their companies' ability to innovate. Often the most creative people also tend to be somewhat different, even eccentric. Two researchers call these employees "the odd clever people every organization needs" because they use their creativity to create disproportionate amounts of value for their companies.[43] Hiring creative people was one of the keys to Bell Labs' impressive record of innovation. The company hired the smartest people it could find from a variety of disciplines, backgrounds, and philosophies; encouraged them to interact with and support one another; and gave them the freedom to dream up creative ideas, many of which failed. The ones that succeeded, however, changed the world.[44]

ESTABLISH AN ORGANIZATIONAL STRUCTURE THAT NOURISHES CREATIVITY John Kao, an economist whose nickname is "Mr. Creativity," says innovative companies are structured like spaghetti rather than a traditional pyramid. In a spaghetti-style organization, employees are

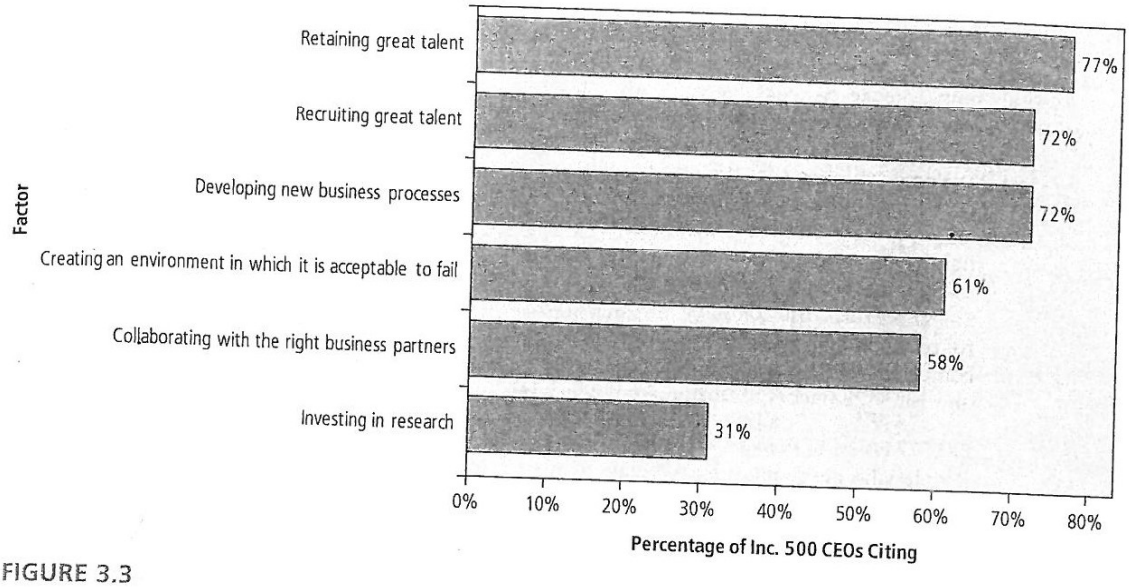


FIGURE 3.3

Factors That Contribute to Companies' Ability to Innovate

Source: Based on "Idea Factories," *Inc.*, September 2013, pp. 104–105.

encouraged to mix and mingle constantly so that creative ideas flow freely throughout the company.[45] At innovative companies, managers create organizational structures and cultures that emphasize the importance of creativity. At FremantleMedia Ltd., the London-based television production company behind hit shows such as *Idols* and *X Factor*, managers have established a structure that encourages and rewards creativity. Every year, the company sponsors Fremantle Market, an event at which executives from production companies around the world pitch their ideas for new television shows to each other, often by showing a trial episode. Show creators explain the premise behind their shows and answer questions from their colleagues about target audiences, production costs, and the potential for links to other media, especially the Internet. Because of FremantleMedia's internal licensing system, executives have the autonomy to decide whether to purchase a show for distribution in their own countries. Shows that attract the most interest receive funding and go on the air.[46]

EMBRACE DIVERSITY One of the best ways to cultivate a culture of creativity is to hire a diverse workforce. When people solve problems or come up with ideas, they do so within the framework of their own experience. Hiring people from different backgrounds, cultural experiences, hobbies, and interests provides a company with crucial raw materials needed for creativity. Smart entrepreneurs enhance organizational creativity by hiring beyond their own comfort zones.

Focusing the talent and creativity of a diverse group of employees on a problem or challenge is one of the best ways to generate creative solutions. Research by Harvard Business School professor Karim Lakhani concludes that the experiences, viewpoints, and thought processes of diverse groups of people are powerful tools for solving problems creatively. "It's very counterintuitive," says Lakhani, "but not only did the odds of a [problem] solver's success actually increase in fields outside his expertise, but also the further a challenge was from his specialty, the greater was the likelihood of success."[47] The lesson for entrepreneurs: to increase the odds of a successful creative solution to a problem, involve in the process people whose background and experience lies *outside* the particular problem area. One manager says, "They create a little grit to stimulate the oyster to produce a pearl."[48]

EXPECT CREATIVITY Employees tend to rise—or fall—to the level of expectations that entrepreneurs have of them. One of the best ways to communicate the expectation of creativity is to encourage them to be creative.

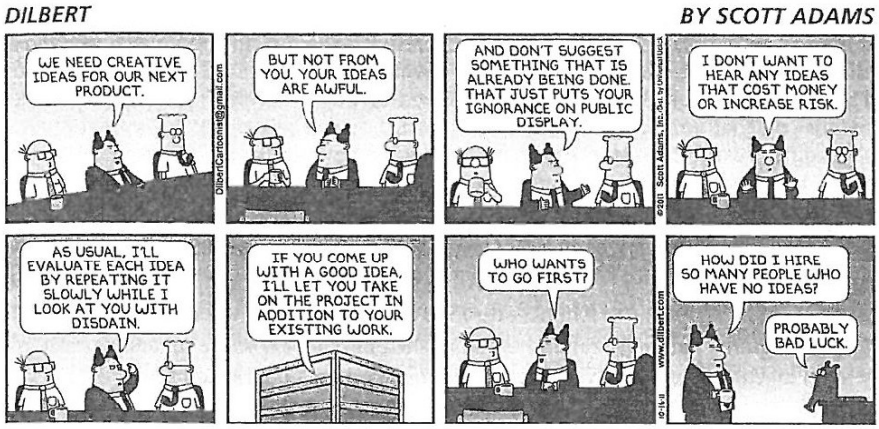
ENTREPRENEURIAL PROFILE: Greg Creed: Taco Bell As Taco Bell, the chain of fast-food Mexican restaurants, approached its 50th birthday, CEO Greg Creed challenged a team of employees to reinvent the company's traditional crunchy taco. Brainstorming sessions produced more than 30 potential ideas, but the one that generated the most interest was a Doritos-flavored taco shell packed with Taco Bell ingredients. In an early test, the team purchased a paint-spray gun at Home Depot so that they could spray Doritos flavoring onto a taco shell. Once Taco Bell's test kitchen developed a prototype, taste tests began, and the product was a flop with customers. The team went back to the drawing board and experimented with 45 recipes before narrowing the field to three for market testing. The tests, which were conducted in a handful of cities around the country, resulted in a clear winner, and soon the Internet was buzzing with hype about Taco Bell's new taco. The company introduced the Doritos Locos Taco, and it became the most successful product launch in Taco Bell history, selling 100 million tacos in just 10 weeks and increasing company sales by 13 percent. Taco Bell has since introduced the Cool Ranch Doritos Locos Taco, and with 123 flavors of Doritos from which to choose, has more new tacos planned.[49] ■

EXPECT FAILURE AND LEARN FROM IT Creative ideas will produce failures as well as successes. People who never fail are not being creative. Creativity requires taking chances, and managers must remove employees' fear of failure. The surest way to quash creativity throughout an organization is to punish employees who try something new and fail. Google allows employees to spend up to 20 percent of their time working on "pet projects" that they find exciting and believe have potential. In addition, Google provides seed capital for its employees' most promising ideas. The company credits its policy with creating some of its most successful product innovations, including Gmail, its Web-based e-mail service.[50]

ENTREPRENEURIAL PROFILE: Jason Seiken: PBS Digital When Jason Seiken became head of PBS's then-struggling digital division, he went beyond expecting failure and announced to employees that failure was required. "If you don't fail enough times during the coming year, you'll be downgraded because if you're not failing enough, you're playing it safe," he says. "The idea was to deliver a clear message: Move fast. Iterate fast. Be entrepreneurial. Don't be afraid that if you stretch and sprint you might break things. Executive leadership has your back." The change among employees was immediate, profound, and exactly what Seiken was trying to achieve. Employees began trying innovative ideas for the PBS Web site, many of which failed and some of which became huge successes. Had Seiken not shaken up the existing culture with the "failure requirement," many of those ideas would never have come to light. One idea, Garden of Your Mind, was a remix of old Mr. Rogers clips in which the genteel host bursts into song; within 48 hours of posting, the video topped the most viewed and most shared video on YouTube. Seiken's attitude toward failure spread across the organization as employees adopted the mantra, "Reinvent PBS."[51] ■

INCORPORATE FUN INTO THE WORK ENVIRONMENT Smart entrepreneurs know work should be fun, and although they expect employees to work hard, they create a company culture that allows employees to have fun. "If you want creative workers, give them enough time to play," says actor John Cleese. At Radio Flyer, the Chicago-based company that makes the classic little red wagon for children, employees routinely participate in fun activities at work that include karaoke, tricycle races, pumpkin-carving contests, a Hollywood Squares game, and others. CEO Robert Pasin intentionally has made fun events a part of the company's culture. "There's method to the madness," says the company's "chief wagon officer," pointing out that the company's success depends on creative employees who are motivated and engaged in their work.[52]

ENCOURAGE CURIOSITY Curiosity is an important ingredient in creativity. Children are innately curious, which is one reason they are so creative. Creativity expert Hal Gregersen says innovators constantly question the world around them and involve others in helping them in answering the questions they pose. Entrepreneurs and their employees constantly should ask "what-if" questions and take a "maybe-we-could" attitude. Challenging standing assumptions about how something should be done ("We've always done it that way.") is an excellent springboard for creativity. Doing so allows people to break out of assumptions that limit creativity. Supporting employees' extracurricular activities also can spur creativity on the job. For instance, M. P. Muller, founder of Door Number 3, a branding agency, paid for a comedy improvisation class for the company's art director, believing that it would enhance the director's creative talents.[53]



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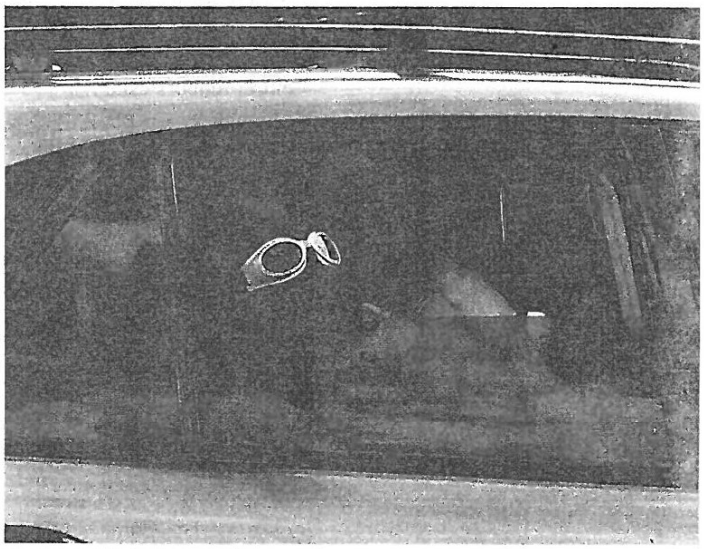
Encouraging employees to "think big" also helps. Creativity expert John Kao points out that, although incremental innovation can be useful, it is not likely to make a company a winner. Instead, the real opportunity for creating a significant competitive edge lies in creating innovations that disrupt and revolutionize an entire industry.

DESIGN A WORK SPACE THAT ENCOURAGES CREATIVITY The physical environment in which people work has an impact on their level of creativity. The cubicles made so famous in the Dilbert cartoon strip can suck creativity right out of a work space. Transforming a typical office space—even one with cubicles—into a haven of creativity does not have to be difficult or expensive. Covering bland walls with funny posters, photographs, murals, or other artwork; adding splashes of color; and incorporating live plants enliven a work space and enhance creativity. Designs that foster employee interaction, especially informal interaction, enhance an organization's creative power.

Because creativity is at the heart of their jobs, employees at Davison Design and Development, a product design company, work in a setting that more closely resembles an amusement park than an office complex. CEO George Davison designed the office, known as Inventionland™, to get employees out of their offices, to interact with one another, and to be inspired by a fun, whimsical environment. The 60,000-square-foot space resembles an amusement park and includes a pirate ship where employees design toys and games for clients and a Thinktank Treehouse for hardware designers. Davison calls Inventionland™ "the world's most innovative workplace" and says the unusual design has helped fuel the company's growth.[54] Even though creating their own version of Inventionland™ may not be practical for most businesses, entrepreneurs can stimulate creativity by starting meetings with some type of short, fun exercise designed to encourage participants to think creatively.

VIEW PROBLEMS AS OPPORTUNITIES Every problem offers the opportunity for innovation. One of the best ways to channel a company's innovative energy productively is to address questions that focus employees' attention on customers' problems and how to solve them.

ENTREPRENEURIAL PROFILE: Roni and Ken Di Lullo: Doggles On a trip to the dog park with their border collie, Midknight, Roni and Ken Di Lullo noticed that Midknight kept missing the Frisbee during their game of fetch. They soon discovered that he was sensitive to sunlight, which led Roni to retrofit a pair of sports goggles for Midknight. People who saw Midknight were so amused that Roni created a Web site with photos of their beloved dog wearing his sports goggles. Before long, dog owners began contacting Roni, asking to purchase a pair of goggles for their pets. To fill each order, Roni purchased a



Rick Roach/ASSOCIATED PRESS

pair of sports goggles and modified them to fit each customer's dog. As sales grew, Roni realized that she had inadvertently launched a unique business, something she never intended to do because she had a full-time job as a software developer. She named the product Doggles and found an eyewear manufacturer in Taiwan who created goggles with a broader nose bridge and deeper lens cup that would fit a wide range of dogs, from Chihuahuas to Great Danes. Every pair of Doggles features shatterproof, anti-fog lenses that block 100 percent of UV rays and adjustable head and chin straps. Doggles also offers goggles with prescription lenses for dogs that have undergone cataract surgery. Doggles sell for $16 to $20 per pair at more than 3,500 pet boutiques and at stores such as Target, Amazon, and Petco. Today, Doggles generates more than $3 million in annual sales.[55] ■

PROVIDE CREATIVITY TRAINING Almost everyone has the capacity to be creative, but developing that capacity requires training. Training accomplished through books, seminars, workshops, and professional meetings can help everyone learn to tap their creative capacity.

ELIMINATE BUREAUCRATIC OBSTACLES AND PROVIDE THE SUPPORT NECESSARY FOR INNOVATION Just as a good carpenter needs certain tools to do his or her job, employees need certain resources and support to be creative, including freedom from bureaucracy to pursue their ideas. Do innovators need hardware, software, time to collaborate, or other resources? Entrepreneurs also must remember that creativity often requires nonwork phases, and giving employees time to "daydream" is an important part of the creative process. The creativity that employees display when they know managers value innovation can be amazing—and profitable. These **intrapreneurs**, entrepreneurs who operate within the framework of an existing business, sometimes can transform a company's future or advance its competitive edge. To encourage intrapreneurial innovation, Microsoft renovated one of its older buildings, transforming it into the Garage, an incubator equipped with all of the latest technology for employees to explore and develop ideas they have for new products and services. Garage director Quinn Hawkins says the inspiration for the incubator (and its name) came from all of the great companies, such as Apple, Hewlett-Packard, and Amazon, that started in garages. After receiving four e-mails in one week with missing attachments, software engineer Bhavesh Chauhan used the Garage's resources to develop a program that automatically scans e-mails for words that indicate that the user intends to send an attachment. If the e-mail contains no attachment, a notice pops up to alert the user. Chauhan's forgotten attachment detector appeared in Microsoft's Office 2013 software.[56]

intrapreneurs
entrepreneurs who operate within the framework of an existing business.

DEVELOP A PROCEDURE FOR CAPTURING IDEAS Small companies that are outstanding innovators do not earn that mantle by accident; they have a process in place to solicit and then collect new ideas. When workers come up with creative ideas, however, not every organization is prepared to capture them. The unfortunate result is that ideas that might have vaulted a company ahead of its competition or made people's lives better simply evaporate. Without a structured approach for collecting employees' creative concepts, a business leaves its future to chance. Clever entrepreneurs establish processes within their companies that are designed to harvest the results of employees' creativity. Sadler's Wells, a dance group that operates three theaters in London and whose mission is to be the center of innovation in dance, has fashioned a procedure for capturing and developing creative ideas. Representatives scout a variety of promising dancers and invite them to its studios, where they work together in small teams to develop new dance performances. The dance teams present their creations to Sadler's Wells' producers, theater managers, and dancers. Sadler's Wells invests in the creations that offer the greatest potential, often testing them in its smaller theaters before taking them to its main stage.[57]

TALK WITH CUSTOMERS—OR, BETTER YET, INTERACT WITH THEM Innovative companies take the time to get feedback about how customers use the companies' products or services, listening for new ideas. The voice of the customer can be an important source of creative ideas, and the Internet allows entrepreneurs to hear their customers' voices quickly and inexpensively. Some companies observe their customers actually using their products or services to glean ideas that may lead to improvements and new features. Other companies go further, forging alliances with customers to come up with creative ideas and develop new products based on them. A recent survey of the CEOs of *Inc.*'s 500 fastest growing companies, reports that although customers are

the most common source of ideas for new products and services, only 37 percent of companies have a formal process for collecting customers' ideas.[58]

MONITOR EMERGING TRENDS AND IDENTIFY WAYS YOUR COMPANY CAN CAPITALIZE ON THEM Tracking trends is an excellent way to generate ideas for new products, services, or business models. Taco Bell, the quick-service chain of Mexican restaurants, invests resources in monitoring demographic and social trends that influence customers' dining habits. One trend the company recently identified is the demand for healthier menus. To capitalize on this trend, Taco Bell worked with celebrity chef Lorena Garcia to introduce a fresher, lighter, and healthier Cantina Bell product line. Market tests show that the Cantina Bell line is popular among women and older customers and has enhanced customers' perceptions of Taco Bell's quality image. Just one year after its launch, Cantina Bell products accounted for 5 percent of the company's sales. Taco Bell normally creates about 200 new product ideas each year before winnowing them down to about 20 products to introduce into test markets. Those that succeed in the test markets are rolled out nationwide. "Fail to innovate at your own risk," says Taco Bell's chief marketing officer.[59]

LOOK FOR USES FOR YOUR COMPANY'S PRODUCTS OR SERVICES IN OTHER MARKETS Focusing on the "traditional" uses of a product or service limits creativity—and a company's sales. Entrepreneurs can boost sales by finding new applications, often in unexpected places, for their products and services.

ENTREPRENEURIAL PROFILE: Neil Wadhawan and Raj Raheja: Heartwood Studios In 2002, Neil Wadhawan and Raj Raheja launched Heartwood Studios, a company that produced three-dimensional renderings and animations of buildings and products for architects and designers. Their business was successful, but a brainstorming session helped the entrepreneurs to realize that their company's three-dimensional renderings had applications in other industries as well. Today Heartwood Studios has clients in the defense and aerospace industries as well as in the fields of entertainment and sports. In fact, the company creates animations for use on the giant screens in sports arenas for several professional sports teams.[60] ■

REWARD CREATIVITY Entrepreneurs can encourage creativity by rewarding it when it occurs. Financial rewards can be effective motivators of creative behavior, but nonmonetary rewards, such as praise, recognition, and celebration, usually offer more powerful incentives for creativity.

MODEL CREATIVE BEHAVIOR Creativity is "caught" as much as it is "taught." Companies that excel at innovation find that the passion for creativity starts at the top. Entrepreneurs who set examples of creative behavior, taking chances, and challenging the status quo soon find their employees doing the same.

ENTREPRENEURIAL PROFILE: Jason Fried: 37signals Jason Fried, cofounder of 37signals, a Chicago-based software company, compares his company's product line to the apple trees on his farm. Fried routinely prunes his apple trees, noting that pruning gives them a stronger foundation for the future. Fried applies that same logic to his company, regularly pruning the company's software products. Observers were stunned when Fried sold to another business a service that generated $17,000 per month in profit for 37signals. A few months later, however, at a company meeting, the staff came up with ideas for two new products, one a variation of an existing product, and the other a totally new product. Fried says that the ideas for new products would never have emerged unless 37signals took the bold step of cutting some of its old products. Growing strong new limbs in a business requires the entrepreneur to prune away the old ones.[61] ■

DON'T FORGET ABOUT BUSINESS MODEL INNOVATION As Jason Fried's experience suggests, creating new products and services is the lifeblood of a company's long-term success; however, business model innovations can produce significant impact on a business as well. A study by the consulting firm Doblin Group reveals that although companies focus most of their creative resources on developing new products and product extensions, those investments are least likely to produce a positive return. In fact, the success rate for new products and product extensions is just 4.5 percent. Innovations in a company's business model, customer service process, distribution system, customer value stream, and internal processes produce higher rates of return.[62]

Apple's iTunes store has proved to be a valuable business model innovation, providing a system for billions of people to download music, apps, ebooks, and movies conveniently and easily. Since its launch in 2001, iTune's 500 million-plus active users have downloaded more than 50 billion apps and 25 billion songs (from its library of 35 million songs). Apple's business model innovation now generates $16 billion in annual revenue for the company.[63]

Enhancing Individual Creativity

Just as entrepreneurs can cultivate an environment of creativity in their organizations by using the techniques described previously, they can enhance their own creativity by using the following techniques.

ALLOW YOURSELF TO BE CREATIVE As we have seen, one of the biggest obstacles to creativity occurs when a person believes he or she is not creative. A recent study by Adobe shows that just 52 percent of people in the United States (and only 39 percent of people globally) believe they are creative.[64] Giving yourself the permission to be creative is the first step toward establishing a pattern of creative thinking. Refuse to give in to the temptation to ignore ideas simply because you fear that someone else may consider them "stupid." When it comes to creativity, there are no stupid ideas!

ENTREPRENEURIAL PROFILE: Robert Bigelow: Bigelow Aerospace As a child living in Las Vegas, Robert Bigelow witnessed the mushroom clouds from the first tests of atomic bombs in the Nevada desert. Fascinated by science, Bigelow soon was captivated by stories of space travel. Bigelow went on to build a highly successful hotel chain, Budget Suites America, that made him a billionaire. In 1998, the hotelier launched Bigelow Aerospace, a company that recently signed a contract with NASA to provide a new type of inflatable space pod called the Bigelow Expandable Activity Module (BEAM) to be attached to the International Space Station (ISS). The module, which resembles a large balloon made of kevlar and other high-tech materials, provides many advantages, including low cost and light weight, and is 50 percent cheaper to launch than traditional rigid modules. Once in space, astronauts simply attach the BEAM to the ISS and inflate it to its full 560-cubic-foot volume. Bigelow's long-term goal is to use BEAM technology to create inexpensive commercial space stations to lease to businesses, governments, and wealthy individuals who want to spend time in space.[65] ■

FORGET THE "RULES" Creative individuals take a cue from Captain Jack Sparrow in the Pirates of the Caribbean series of movies. When faced with a difficult (sometimes impossible) situation, Sparrow (played by Johnny Depp) usually operates outside the rules and, as a result, comes up with innovative solutions. Sparrow's unwillingness to be encumbered by rules frees him to develop innovative, often unusual solutions to the problems he encounters.

GIVE YOUR MIND FRESH INPUT EVERY DAY To be creative, your mind needs stimulation. Do something different each day—listen to a new radio station, take a walk through a park or a shopping center, or pick up a magazine you never read.

ENTREPRENEURIAL PROFILE: Doris Raymond: The Way We Wore The Way We Wore, a huge vintage clothing store in Los Angeles started by Doris Raymond in 2004 that stocks garments from the Victorian era to the 1980s, has become a destination for designers from many fashion houses and retailers, ranging from Marc Jacobs to Forever 21, who are looking for inspiration for their clothing collections. Recognizing that meeting customers' demand for fresh designs gives their clothing lines a competitive advantage, many designers are looking to the past for creative ideas, taking note not only of fabrics and patterns but also of the smallest details, such as buttons and the type of stitching used on pockets. These fashion experts have discovered that exposing their minds to "new" designs is a great way to stimulate their own creativity.[66] ■

TAKE UP A HOBBY Hobbies provide not only an avenue to escape your regular routine, but they also give your mind fresh input that can be a source of creative ideas. Izhar Gafni, a bicycling enthusiast, was in a bicycle shop talking about his hobby ("Bicycling is in my soul," he says) when the conversation turned to a man who had invented a cardboard canoe. The concept fascinated him. "Why not make a bicycle out of cardboard?" he wondered. Gafni went to work and invented a low-cost, eco-friendly bicycle made entirely out of recycled cardboard and car tires.

Tight folding gives the cardboard frame strength, and a special coating makes the cardboard waterproof and fireproof. Although the bike weighs just 27 pounds, it is strong enough to support a 275-pound passenger. Gafni, who started Cardboard Technologies to market his invention, says each bike costs between $9 and $12 to build, and he plans to sell them for $20 each.[67]

TRAVEL—AND OBSERVE Visiting other countries (even other states) is a creativity stimulant. Travelers see new concepts and engage in new experiences that can spark creative ideas. While on vacation, Tom Adeyoola watched his girlfriend revel in the inexpensive custom-made clothing available in Vietnam because she was frustrated by the poor fit of most off-the-rack products available in online shops in their native United Kingdom. Adeyoola began to ponder ways of improving the traditional online buying experience and came up with the idea of a tool that allows online shoppers to try on clothing virtually. A Cambridge professor connected him with a former student, and the two young men started Metail, a London-based technology company that allows shoppers to upload basic body measurements and photos of themselves that Metail transforms into a three-dimensional avatar that is 94 to 96 percent accurate. Customers who shop at companies that subscribe to Metail can use their avatars to try on virtual garments to test their fit. With Metail, customers find clothes that fit them better, and retailers experience lower costs due to returns from poor-fitting items.[68]

OBSERVE THE PRODUCTS AND SERVICES OF OTHER COMPANIES, ESPECIALLY THOSE IN COMPLETELY DIFFERENT MARKETS Creative entrepreneurs often borrow ideas from companies that are in businesses totally unrelated to their own. The founders of Project Frog, a San Francisco-based builder, noted the popularity of eco-friendly modular residential homes and applied the concept to building prefabricated schools and government buildings faster and cheaper than traditional "stick-built" structures. CEO Ann Hand soon extended the company's reach into retail and healthcare. "We design a common chassis for different types of buildings that people can reprogram according to their needs," she says. Project Frog uses sophisticated software to create a three-dimensional model of a structure before it actually manufactures all of the individual components for on-site assembly. Its buildings include energy-saving features, optimize the use of natural light, and result in cost savings of up to 30 percent. Project Frog, which has attracted $30 million in venture capital, generates more than $25 million in annual sales.[69]

RECOGNIZE THE CREATIVE POWER OF MISTAKES AND ACCIDENTS Innovations sometimes are the result of serendipity, finding something while looking for something else, and sometimes they arise as a result of mistakes or accidents. Creative people recognize that even their errors may lead to new ideas, products, and services. Louis Daguerre, a scene painter for the Paris Opera, was fascinated with lighting and in 1822 began conducting experiments with the effect of light on translucent screens. In 1829, Daguerre formed a partnership with Joseph Niecpe, who had invented a primitive version of photography called the heliograph in 1829. (The exposure time for Niecpe's first photograph was a mere eight hours!) The two men worked for years trying to capture photographic images on metal plates treated with silver iodide, but they made little progress before Niecpe died in 1833. One evening in 1835, Daguerre placed one of his treated plates in his chemical cupboard, intending to recoat it for other experiments. When he removed it later, he was surprised to see a photographic image with brilliant highlights. Excited but puzzled by the outcome, Daguerre finally discovered that mercury vapors from a broken thermometer in the cupboard had caused the photographic image to appear on the treated metal plate. Daguerre refined the process, naming it Daguerreotype after himself. The world of modern photography was born—and an accident played a significant role.[70]

NOTICE WHAT IS MISSING Sometimes entrepreneurs spot viable business opportunities by noticing something, often very practical and simple, that is *missing*. The first step is to determine whether a market for the missing product or service actually exists (perhaps the reason it does not exist is that there is not market potential), which is one of the objectives of building a business plan.

ENTREPRENEURIAL PROFILE: Mark Bowles and EcoATM Fewer than 20 percent of the discarded electronic devices in the United States are recycled; most are burned or dumped in landfills, where they leak dangerous chemicals into the environment. After spending 25 years in the wireless and technology industries, serial entrepreneur Mark Bowles noticed that no one

was doing anything about the problem and decided it was time to take action. Inspired by Coinstar change-counting machines that he saw in many locations, Bowles spent three years developing the ecoATM, an ATM-like machine that uses an artificial intelligence-based vision system to recognize 4,000 types of phones, MP3 players, and tablets and identify any damage. The ecoATM taps into a real-time global auction system to offer customers competitive prices for their old electronic devices. The machine even has thumbprint scanning technology designed to thwart thieves who might try to use the ecoATM as a fence for stolen e-devices. EcoATM resells 75 percent of the devices it collects to refurbishers with the remainder of them going to authorized e-waste recyclers. With 500 kiosks already in place across the United States, Bowles is making plans to expand ecoATM internationally. ■

LOOK FOR WAYS TO TURN TRASH INTO TREASURE Some entrepreneurs achieve success by finding creative ways to turn trash into treasure. Before coffee growers can ship coffee beans to coffee makers, they must strip away the skin of the fruit that surrounds the bean. In Hawaii alone, coffee growers throw away 40 million pounds of coffee fruit skins each year. Serial entrepreneur Shaun Roberts took note and developed a way to transform coffee fruit skin, which also contains caffeine and is packed with antioxidants, into a line of energy drinks called KonaRed. His 15-person company, based in Kalaheo, Hawaii, purchases coffee fruit skins from growers, dries them, and processes them into a thick, molasses-like concentrate that it mixes with various fruit juices to create a line of healthful beverages. In addition to selling KonaRed through retail outlets in Hawaii and on the mainland, Roberts's company offers monthly subscriptions through its Web site.[71]

KEEP A JOURNAL HANDY TO RECORD YOUR THOUGHTS AND IDEAS Creative ideas are too valuable to waste, so always keep a journal nearby to record them as soon as you get them. Leonardo da Vinci was famous for writing down ideas as they struck him. Patrick McNaughton invented the neon blackboards that restaurants use to advertise their specials. In addition to the neon blackboard, McNaughton has invented more than 30 new products, many of which are sold through the company he and his sister, Jamie, own. McNaughton credits much of his creative success to the fact that he writes down every idea he gets and keeps it in a special folder. "There's no such thing as a crazy idea," he insists.[72]

LISTEN TO OTHER PEOPLE No rule of creativity says an idea has to be your own! Sometimes the best business ideas come from someone else, but entrepreneurs are the ones to act on them.

ENTREPRENEURIAL PROFILE: Cameron Roelofson: Splash Mobile Car Wash Cameron Roelofson, owner of Splash Mobile Car Wash in Concord, Ontario, washes 2,500 tractor-trailer trucks per week during warm months, but sales in his highly seasonal business fall to nothing during the frigid winters. On one cold winter day, Roelofson was talking with an acquaintance who asked if he would use his mobile truck-washing equipment to put water into an outdoor skating rink. He agreed and quickly realized the potential for a business that would offset seasonality in sales in his truck-washing business. Roelofson began advertising, and sales took off. For $1,000 to $2,000, Splash builds a frame with a reusable liner and then fills it with water. Three days later, frozen solid in Ontario's winter weather, the rink is ready for skating or hockey. In the spring, Splash returns to disassemble the rink and store it until the next winter.[73] ■

LISTEN TO CUSTOMERS Some of the best ideas for new products and services or new applications of an existing product or service come from a company's customers. Entrepreneurs who take the time to listen to their customers often receive ideas that they may never have come up with on their own. "You must talk to and deeply understand your customers to build products, services, and experiences that work in today's consumer-driven market," says Eric Holtzclaw, founder and CEO of Laddering Works, a marketing and product strategy firm. Middleby Marshall, a foodservice equipment maker founded in 1888, relies on feedback from customers to guide its new product development efforts. The company recently introduced its CTX oven, which combines a griddle, a fryer, and a charbroiler into a single unit that cooks food fasters, uses less energy, and improves the efficiency of commercial kitchens. "Our business is built on a high degree of customer interaction," says president Mark Sieron. "We listen to our customers, and that's what drives our innovation."[74]

GET ADEQUATE SLEEP Sleep restores both our bodies and our brains. A study by the Mental Health Foundation shows a correlation between sound sleep and a person's ability to produce creative ideas and new insights.[75]

WATCH A MOVIE Great business ideas come from the strangest places, even the movies. As a child, Stanley Yang was fascinated by sci-fi movies such as *Star Wars*. That fascination led him to become an engineer so that he could transform his ideas into reality. Yang's company, NeuroSky, has developed headsets that allow people to control video games with their minds using biosensor technology, a concept used by an advanced alien race in the movie *Battle Los Angeles*. "Movies may spark an idea," says Yang, who still dreams of building a functional light saber.

TALK TO A CHILD As we grow older, we learn to conform to society's expectations about many things, including creative solutions to problems. Children place very few limitations on their thinking; as a result, their creativity is practically boundless. (Remember all the games you and your friends invented when you were young?)

DO SOMETHING ORDINARY IN AN UNUSUAL WAY Experts say that simply doing something out of the ordinary can stimulate creativity. To stimulate his own creativity, Scott Jones, an entrepreneur who is known as "the guy who invented voice mail" (and many other items as well), often engages in what other people might consider bizarre behavior—eating without utensils, watching television sitting one foot away from the screen, or taking a shower with his eyes closed. "Anything I normally do, I'll do differently just to see what happens," says Jones.[76]

KEEP A TOY BOX IN YOUR OFFICE Your box might include silly objects, such as wax lips, a yo-yo, a Slinky, fortune cookie sayings, feathers, a top, a compass, or a host of other items. When you are stumped, pick an item at random from the toy box and think about how it relates to your problem.

TAKE NOTE OF YOUR "PAIN POINTS" Do other people experience them as well? Entrepreneurs often create innovations to solve problems they themselves face. Observing "pain points" that result from missing products or services or flaws in existing products or services can be an excellent source of business ideas.

ENTREPRENEURIAL PROFILE: Donna Browning: Sweaty Bands Fitness instructor Donna Browning was tired of elastic headbands that kept slipping out of place during her exercise classes and decided to make one that would stay put. She borrowed a sewing machine and made several prototypes to test. She discovered that velvet–lined ribbon with elastic worked best. Browning made a batch of headbands, gave a few as gifts, and sold the rest out of her gym bag. The positive feedback from her early customers encouraged Browning to start Sweaty Bands with her husband, and the copreneurs soon were selling headbands online at $15 to $18 each. Aggressive marketing and public relations sparked sales, and Sweaty Bands now sells 250,000 headbands per year and employs 100 people. The Brownings recently signed a deal to make sorority-themed Sweaty Bands and are exploring potential relationships with college and professional sports teams. Sales recently hit $12 million and continue to grow rapidly.[77] ■

DO NOT THROW AWAY SEEMINGLY "BAD" IDEAS Some creative ideas prove to be impractical, too costly, or too silly to work. Creative entrepreneurs, however, do not discard these seemingly bad ideas. Instead, they ask, "What part of this idea can I build on?" and "What could I change about this idea to make it work?" They realize that seemingly bad ideas can be the nucleus of a really good idea. West Paw Design, a company based in Bozeman, Montana, that produces eco-friendly pet toys, sponsors a creativity contest in which its 36 employees, from president to seamstresses, form small teams to develop prototypes of new product ideas. The winning team receives the coveted Golden Hairball Award, a statue reminiscent of the Oscar but with one of the company's cat toys perched atop its head. President Spencer Williams says many of the great ideas for new products come from ideas that don't win the contest. The company's R&D team meets after each contest to review *all* of the ideas employees submit. "We look for one piece of a new idea," he says.[78]

COLLABORATE WITH OTHERS Working with other people to solve a problem or to generate ideas brings a fresh perspective to the situation. Two or more people usually are more creative than one person working alone. GE, a company that owns thousands of patents, recently partnered with

Quirky, a crowdsourcing site that allows an online community of more than 500,000 inventors to collaborate on generating ideas and solving problems, to get new ideas on ways to use its patents. Inventors on Quirky are busy finding new ways to apply technology from GE such as coatings that protect electronics from moisture and a device that cools jet engines. Inventors whose ideas prove commercially viable share in the profits they generate. Ben Kaufman, cofounder of Quirky, says his goal is to create an invention machine.[79]

READ BOOKS ON STIMULATING CREATIVITY OR TAKE A CLASS ON CREATIVITY Creative thinking is a technique anyone can learn. Understanding and applying the principles of creativity can improve dramatically the ability to develop new and innovative ideas.

DOODLE Research shows that engaging in artistic activities, even as simple as doodling, stimulates creativity.[80] Doodling keeps a person's brain engaged even when he or she not focused on a particular task.

TAKE SOME TIME OFF Relaxation is vital to the creative process. Getting away from a problem gives the mind time to reflect on it. It is often during this time, while the subconscious works on a problem, that the mind generates many creative solutions. One study reports that 35 percent of entrepreneurs say they come up with their best ideas during downtime, when they are away from work.[81] One creativity expert claims that fishing is the ideal activity for stimulating creativity. "Your brain is on high alert in case a fish is around," he says, "but your brain is completely relaxed. This combination is the time when you have the 'Aha!' moment."[82]

BE PERSISTENT Entrepreneurs know that one secret to success is persistence and a "don't-quit" attitude. Twelve publishers rejected J. K. Rowling's manuscript about the adventures of a boy wizard and his friends, which she started writing at age 25 when she was a single mother trying to raise her children on welfare. Finally, Bloomsbury, a small London publishing house, agreed to publish 1,000 copies of *Harry Potter and the Philosopher's Stone*. Rowling's seven-part Harry Potter book series went on to sell more than 450 million copies worldwide, making Rowling the first billionaire author.[83]

Hands On . . . How To

Be a Successful Innovator

Creativity and innovation traditionally have played an important part in entrepreneurial success. Today, their role has become an even more vital component as businesses face increasing pressure to produce innovations to remain competitive. One writer notes that until recently people achieved success by copying other people, taking what they know and applying it. Today, however, because unique challenges are a regular part of life, success goes to those brave enough to cross boldly into the unknown.

Entrepreneurs are among the brave souls who challenge existing ideas, norms, values, and business practices and often produce valuable breakthrough products that make them and their companies terrific success stories. What lessons can we learn from successful entrepreneurs about innovation?

Embrace Fear

Creative entrepreneurs face their fears. Ask yourself, "What frightens me about my business?" Are you fearful that a competitor will introduce a new product or service that will make yours obsolete? Are you concerned that customers may find your product or service less appealing? Are trade shows still the best way to reach your customers? Once you have identified the fears that most concern you, address them. Explore them. If you were introducing your company's product or service today, what would it look like? What features would it offer?

Recognize That "Innovation" Is Not Necessarily Synonymous with "Invention"

Some of the most successful entrepreneurs in history actually did not invent the products that made them famous. Henry Ford, founder of Ford Motor Company, said, "I invented nothing new. I simply assembled into a car the discoveries of other men behind whom were centuries of work." Of course, Ford did make innovations in the auto assembly process, creating in 1913 the first mass-assembly process that made cars affordable for the average person. Similarly, Keyvan Mohajer, founder of San Jose, California-based SoundHound, took technology that has been around for years, music recognition, and created an app that made it easier for people to use. His company's Sound2Sound technology recognizes and identifies any song (even those that a person simply hums) and provides the user with instant access to information

Hands On . . . How To *(continued)*

pertaining to the song, such as biographical sketches of the artist, lyrics, videos, concert dates, upcoming tours, and more. In just two years, the company's customer base has grown from 10 million to more than 100 million. Like Mohajer, successful entrepreneurs often find new ways to connect existing technologies to create value.

Find the Intersection of "Problem" and "Solution"

Some entrepreneurs launch businesses with a focus on marketing their products or services to a particular audience but fail to ask whether their products and services actually solve a real problem customers face. "If you're not solving a problem, the world won't care," explains Ben Kaufman, founder of Quirky, a social product development company that serves aspiring inventors. Successful innovators often spot a "pain point" in their own lives and realize that other people face the same problem as well. As a New York City native, Internet entrepreneur Jay Bregman was very familiar with the inefficiencies in the taxi cab industry. At any given moment, thousands of cabs in major cities are looking for fares, while thousands of people are trying to hail cabs. In fact, Bregman's research shows that taxis in New York City spend 40 percent of their time cruising for fares, while potential passengers have difficulty finding cabs. Bregman, two other Internet entrepreneurs, and three New York City cab drivers found the intersection of "problem" and "solution" when they created Hailo, a company that markets an app that connects cab drivers with passengers for a small fee. Hailo allows passengers to locate a cab within two minutes with just two taps on their smart phones and has become the world's most popular taxi app. Bregman and his cofounders now are turning their attention to developing apps for other markets that suffer from similar inefficiencies.

Entrepreneurs often spot "pain points" by noting the following:

- Complaints they hear from other people
- The inconvenience of buying a product or service
- A fundamental flaw in an existing product or service
- A product or service that can make life easier
- A product or service that can add to one's well-being
- A simpler way to access a product or service

Realize That Innovation Typically Is the Result of an Iterative Feedback Cycle

Innovations often come about when entrepreneurs come up with an idea, test it, discover what works (and what doesn't work), and then modify their idea based on this feedback. This cycle of developing ideas, testing them, and refining them is an essential part of the creative process. Thomas Edison, recipient of a record 1,093 patents, including the patents for the phonograph and the light bulb, once said the real measure of success is the number of experiments that one can squeeze into 24 hours.

Beware of Faulty Assumptions

One of the most dangerous assumptions that innovative entrepreneurs can make is that customers are as excited about their innovations as they themselves are. Like Edison, successful innovators see the pathway to entrepreneurship as a series of experiments. One of the most valuable experiments an entrepreneur can undertake is to get feedback from potential customers. Confirmation of an idea tells an entrepreneur that he or she is on the right track; conversely, lukewarm or negative customer feedback suggests that he or she drop the idea and move to another, more promising one. Andrew Hargadon, director of the Center for Entrepreneurship at the University of California, Davis, recalls a student entrepreneur who had developed a novel pathology device. Part of her feedback cycle included talking with surgeons, whose response was overwhelmingly positive and gave her the confidence to pursue commercializing the device. Her conversations with the surgeons also produced several suggestions for improvement that she had not thought of.

Innovators, says one writer, are "figure-outers." When faced with problems and opportunities, they figure out how to deal with them successfully and in the process create innovations.

Sources: Based on Gwen Moran, "4 Ways to Find Your Next Revolutionary Business Idea," *Entrepreneur*, July 4, 2012, http://www.entrepreneur.com/blog/223893; Kara Ohngren, "Voice of a Generation," *Entrepreneur*, June 2012, p. 68; Katherine Duncan, "A Mobile App That Makes Hailing a Cab Easier and More Efficient," *Entrepreneur*, May 21, 2013, http://www.entrepreneur.com/article/226684; Katherine Duncan, "Brilliant 100: Where To?" *Entrepreneur*, June 2013, p. 54; Andrew B. Hargadon, "7 Ways to Make Students More Entrepreneurial," *Chronicle of Higher Education*, March 28, 2010, http://chronicle.com/article/Teaching-Matters-7-Ways-to/64841; Jeff Cornwall, "The Entrepreneurship Educator," May 2010, p. 1; Donna Fenn, "Will Your New Product Be a Hit or a Flop? Answer These 5 Questions to Find Out," *BNET*, January 20, 2011, http://www.bnet.com/blog/entrepreneurs/will-your-new-product-be-a-hit-or-a-flop-answer-these-5-questions-to-find-out/1571; Dennis Stauffer, "The Best Figure-Outers Win," *Insight Fusion*, June 13, 2011, http://www.insightfusion.com/blog/index.php/.../the-best-figure-outers-win. William S. Pretzer, editor, *Working at Inventing: Thomas A. Edison and the Menlo Park Experience*, (Deerborn: Henry Ford Museum & Greenfield Village, 1989).

The Creative Process

LO6

Describe the steps in the creative process.

Although creative ideas may appear to strike as suddenly as a bolt of lightning, they are actually the result of the creative process, which involves seven steps:

1. Preparation
2. Investigation
3. Transformation
4. Incubation
5. Illumination

6. Verification
7. Implementation

Step 1. Preparation

This step involves getting the mind ready for creative thinking. Preparation might include a formal education, on-the-job training, work experience, and other learning opportunities. This training provides a foundation on which to build creativity and innovation. As one writer explains, "Creativity favors the prepared mind."[84] For example, Dr. Hamel Navia, a scientist at tiny Vertex Pharmaceuticals, was working on a promising new drug to fight the AIDS virus. His preparation included earning an advanced degree in the field of medicine and learning to use computers to create three-dimensional images of the protein molecules he was studying.[85] How can you prepare your mind for creative thinking?

- Adopt the attitude of a lifelong student. Realize that educating yourself is a never-ending process. Look at every situation you encounter as an opportunity to learn.

  ENTREPRENEURIAL PROFILE: Tony Brennan: Sharklet Technologies Tony Brennan, a materials science and engineering professor, was searching for a way to keep barnacles from clinging to ships' hulls. He began studying sharkskin, which is known for its ability to resist microbes, and discovered the key at a microscopic level: the diamond-shaped pattern of tiny tooth-like outcroppings that prevent microbes from sticking. Brennan's research led him to start Sharklet Technologies, a company in Aurora, Colorado, that makes a sharkskin-inspired, micropatterned fabric called SafeTouch that resists the growth of bacteria, including staph, e. coli, and MRSA. It can be applied to almost any high-touch surface. Sharklet is selling SafeTouch to hospitals, labs, research centers, and owners of public spaces that are prone to high concentrations of bacteria. The company recently landed a $2 million investment from Altria Ventures, a venture capital firm.[86] ■

- Read—a lot—and not just in your field of expertise. Many innovations come from blending ideas and concepts from different fields in science, engineering, business, and the arts. Reading books, magazines, and papers covering a variety of subject matter is a great way to stimulate your creativity.

- Clip interesting articles and create a file for them. Over time, you will build a customized encyclopedia of information from which to draw ideas and inspiration.

- Take time to discuss your ideas with other people, including those who know little about it as well as experts in the field. Sometimes, the apparently simple questions that an "unknowledgeable" person asks lead to new discoveries and to new approaches to an old problem. Don Medoff breathed creativity into his Tucson, Arizona–based supplier of windows and doors by bringing in as consultants college students from the nearby University of Arizona. Medoff and his managers briefed teams of students on several of the company's stickiest problems and asked them for ideas on how to solve them. The student teams created new packaging ideas for several products, developed new television commercials, and made suggestions for updating the company's Web site. Medoff, who implemented most of the students' ideas, says that their input has been "invaluable." He is working with the university on other projects for students to tackle.[87]

- Join professional or trade associations and attend their meetings. There you have the chance to interact with others who have similar interests. Learning how other people have solved a particular problem may give you fresh insight into solving it.

- Develop listening skills. It's amazing what you can learn if you take the time to listen to other people—especially those who are older and have more experience. Try to learn something from everyone you meet.

- Eliminate creative distractions. Interruptions from telephone calls, e-mails, and visitors can crush creativity. Allowing employees to escape to a quiet, interruption-free environment enhances their ability to be creative.

Step 2. Investigation

This step requires one to develop a solid understanding of the problem, situation, or decision at hand. To create new ideas and concepts in a particular field, an individual first must study the problem and understand its basic components. Creative thinking comes about when people make careful observations of the world around them and then investigate the way things work (or fail to work). For example, Dr. Navia and another scientist at Vertex had spent several years conducting research on viruses and on a protein that blocks a virus enzyme called protease. His exploration of the various ways to block this enzyme paved the way for his discovery.

ENTREPRENEURIAL PROFILE: Christopher Leamon and Endocyte After earning his PhD in chemistry, Christopher Leamon began researching targeted anticancer therapy using molecules that tumors absorb as "Trojan horses" to deliver drugs that are lethal to them. Initially, Leamon had focused on the vitamin biotin, but after nine months of research and hard work, his experiment was a failure. One morning while sitting at the breakfast table with his wife, Leamon, a longtime cereal lover, was reading the ingredients on the nutrition panel of his box of Kellogg's Frosted Flakes. One of the items, folic acid, caught his attention. Leamon dashed off to the library and found a research paper on how folic acid enters a human cell and realized that this was the breakthrough that he had been seeking. Before long, Leamon had developed a technique for attaching cancer drugs to folic acid so that they would be absorbed and enable cells to fight the disease in much the same way they battle infections. Leamon has licensed the promising therapy to a company called Endocyte, which plans to have drugs on the market within a few years. Leamon says that although he has experienced "Eureka" moments in the lab, none was as significant as his folic acid breakthrough. His encounter with a simple cereal box at breakfast redefined his career and his life.[88] ■

Step 3. Transformation

Transformation involves viewing the similarities and the differences among the information collected. This phase requires two types of thinking: convergent and divergent. **Convergent thinking** is the ability to see the *similarities* and the connections among various and often diverse data and events. "So much of innovation comes from connecting things where other people don't make connections," says Mark Rice, professor of technology entrepreneurship at Olin College.[89]

convergent thinking the ability to see similarities and the connections among various data and events.

ENTREPRENEURIAL PROFILE: Dominique Ansel: Dominique Ansel Bakery Dominique Ansel, owner of the bakery in New York City's SoHo district that created the wildly popular Cronut, says he and his employees devote time every week to brainstorming new product and menu ideas. "Finding a new idea is a lifestyle, not a moment," he says. Ansel and his team identified the best features of two popular bakery products, the croissant, with its layers of light crust, and the doughnut, which may include lush fillings or decadent toppings, or both, and combined them to create the Cronut. Making Cronuts is a labor-intensive process that can take up to three days. Because lines often form outside the bakery two-and-a-half hours before it opens, Ansel has had to impose a two-Cronut-per-person limit on in-store purchases and a six-Cronut limit on advance orders. Although Ansel has kept the price of the Cronut at $5, some customers resell their Cronuts at mark-ups of up to 950 percent.[90] ■

Emmanuel Dunand/AFP/Getty Images/Newscom

Divergent thinking is the ability to see the *differences* among various data and events. While developing his AIDS-fighting drug, Dr. Navia studied the work of other scientists whose attempts at developing an enzyme-blocking drug had failed. He was able to see the similarities and the differences in his research and theirs and to build on their successes while avoiding their failures.

divergent thinking the ability to see among various data and events.

How can you increase your ability to transform the information collected into a purposeful idea?

- Evaluate the parts of the situation several times, trying to grasp the "big picture." Getting bogged down in the details of a situation too early in the creative process can diminish creativity. Look for patterns that emerge.
- Rearrange the elements of the situation. By looking at the components of an issue in a different order or from a different perspective, you may be able to see the similarities and the differences among them more readily. Rearranging them also may help uncover a familiar pattern that had been masked by an unfamiliar structure. After graduating with a degree in physics from Bowling Green University, Jerry Barber spent most of his career designing rides for amusement parks and eventually started his own company, Venture Ride Manufacturing, which he operated for 18 years before selling it. The holder of 51 patents, Barber's most famous amusement park invention is the "free fall" ride, such as Disney's Tower of Terror. One day, after visiting with a friend who was delivering an enormous gearbox for a wind turbine, Barber began to think about creating a more efficient wind turbine. Drawing on his knowledge of a Ferris wheel's design, Barber eliminated the need for a complex gearbox and rearranged other turbine components to create the innovative WindWheel. A unique structural ring supports the five-blade turbine that turns with a slower, more efficient rotation, which dramatically reduces the level of noise pollution and makes the turbine more cost effective to operate. Barber's design also includes blades that come in sections, allowing for much easier highway transport.[91]
- Try using synectics (a term derived from the Greek words for "to bring together" and "diversity"), taking two seemingly nonsensical ideas and combining them. For instance, why not launch a bookstore with no physical storefront and no books—an accurate description of what Jeff Bezos did when he came up with the idea for Amazon.com.[92]
- Before locking into one particular approach to a situation, remember that several approaches might be successful. If one approach produces a dead end, don't hesitate to jump quickly to another. Considering several approaches to a problem or opportunity simultaneously would be like rolling a bowling ball down each of several lanes in quick succession. The more balls you roll down the lanes, the greater is the probability of hitting at least one strike. Resist the temptation to make snap judgments on how to tackle a problem or opportunity. The first approach may not be the best one.

Step 4. Incubation

The subconscious needs time to reflect on the information collected. To an observer, this phase of the creative process would be quite boring; it looks as though nothing is happening! In fact, during this phase, it may appear that the creative person is *loafing*. Incubation occurs while the individual is away from the problem, often engaging in some totally unrelated activity. Dr. Navia's creative powers were working at a subconscious level even when he was away from his work, not even thinking about his research on AIDS-fighting drugs.

How can you enhance the incubation phase of the creative process, letting ideas marinate in your mind?

- Walk away from the situation. Time away from a problem is vital to enhancing creativity. A study by Wilson Brill, an expert on creativity, of how 350 great ideas became successful products shows that two-thirds of the ideas came to people while they were *away* from work—in the shower, in their cars, in bed, on a walk, and in other nonwork situations.[93] Doing something totally unrelated to the problem gives your subconscious mind the chance to work on the problem or opportunity. Greg and Meredith Tally own the Best Western Southwest, a hotel in Denver located near Dinosaur Ridge, a famous site where paleontologists found the first fossils of several species of dinosaurs, including the stegosaurus, the allosaurus, and other large sauropods. The copreneurs were about to embark on a major renovation of their 112-room hotel. While on a fossil hunting expedition, Dave, a science and fossil enthusiast, had an idea: Rather than do a generic remodel, why not turn their hotel into an extension of the nearby Morrison Museum of Natural History?

In addition to a heated indoor pool (decorated with a mosaic of the creatures in a Cretaceous Period sea by famous dinosaur artist Larry Felder), the Tallys' renovation includes fossil displays from Dinosaur Ridge and the Morrison Museum ("They have way more stuff than they could ever show," Greg says), museum-like exhibits, and life-size models of dinosaurs. "I could not think of a more unique differentiator than the history of Dinosaur Ridge," Greg says.[94]

- Take the time to daydream. Although it may *look* as if you're doing nothing, daydreaming is an important part of the creative process. That's when your mind is most free from self-imposed restrictions on creativity. Research shows a connection between daydreaming and creativity; people who daydream are better at generating new ideas.[95] Feel free to let your mind wander, and it may just stumble onto a creative solution. Recent research shows that daydreaming is one sign of a well-equipped and active brain. Although daydreaming appears to be a passive activity, it actually keeps the brain in a highly engaged state in which it can make insightful connections and discover brilliant insights.[96]

- Relax—and play—regularly. Perhaps the worst thing you can do for creativity is to work on a problem or opportunity constantly. Soon enough, fatigue walks in, and creativity walks out! Great ideas often are incubated on the golf course, on the basketball court, on a hiking trail, in the hammock, or in a bar.

ENTREPRENEURIAL PROFILE: Kazuhide Sekiyama: Spiber Inc. During an all-night drinking session that included an in-depth conversation about "bug technology," Kazuhide Sekiyama began working to develop a man-made thread that mimics spider web—soft and flexible, yet amazingly strong given its small diameter. In fact, real spider thread is one of nature's miracles; it can stretch 40 percent beyond its original length without breaking and is so strong that a spider web made of strands as thick as a pencil could stop a jumbo jet in flight. Using biomimicry, Sekiyama eventually created an artificial spider thread called Qmonos ("spider web" in Japanese) that he claims is equal to steel in tensile strength with the flexibility of rubber. He created a company, Spiber Inc., to produce and market Spiber Web, which could make lighter, stronger products in many fields, including auto parts, surgical materials, and bulletproof vests.[97] ■

- Dream about the problem or opportunity. "Dreams have been responsible for two Nobel prizes, the invention of a couple of major drugs, other scientific discoveries, several important political events, and innumerable novels, films, and works of visual art," says Harvard Medical School psychologist Deirdre Barrett.[98] Although you may not be able to dream on command, thinking about an issue just before you drift off to sleep can be an effective way to encourage your mind to work on it while you sleep, a process called *lucid dreaming*. Barrett's research suggests that about 50 percent of people can focus their dreams by contemplating a particular problem before they go to sleep, in essence "seeding" the subconscious to influence their dreams.[99] The idea for Chris and Kella McPhee's business, Suburban Camping, came to Chris after he dreamed that he had created elaborate and unique backyard campouts for birthday parties and summer activities. The McPhees, both of whom are camping enthusiasts, used $15,000 of their savings to start their business. They have invested in a line of customized tents and now offer camping events with a variety of themes, including a Harry Potter campout, a girls night out package, a romantic evening, a movie night, and others. Prices range from $80 to $500, and the McPhees already are planning to expand beyond their New Jersey base and into beach camping.[100]

- Work on the problem or opportunity in a different environment—somewhere other than the office. Take your work outside on a beautiful fall day or sit on a bench in a mall. The change of scenery will likely stimulate your creativity.

Step 5. Illumination

This phase of the creative process occurs at some point during the incubation stage when a spontaneous breakthrough causes "the light bulb to go on." It may take place after five minutes—or five years. "An insight is an unexpected shift in the way we understand things," says Gary Klein, a clinical psychologist and author. "It comes without warning. It's not something that we think is

going to happen. It feels like a gift, and, in fact, it is."[101] In the illumination stage, all the previous stages come together to produce the "Eureka factor"—the creation of the innovative idea. In one study of 200 scientists, 80 percent said at least once a solution to a problem had "just popped into their heads"—usually when they were away from the problem.[102] For Dr. Navia, the illumination stage occurred one day while he was reading a scientific journal. As he read, Dr. Navia says he was struck with a "hallucination" of a novel way to block protease.

Although the creative process itself may last for months or even years, the suddenness with which the illumination step occurs can be deceiving, making the process appear to occur much faster than it actually does. One night, Kent Murphy, an electrical engineer, began dreaming about what it would be like to be a photon of light. "I was riding a ray of light moving through the fiber," he recalls about his dream. Murphy, who holds 30 patents, used the insight from his dream to invent a fiber-optic gauge that monitors on a real-time basis the structural wear in airplanes.[103]

Step 6. Verification

For entrepreneurs, validating an idea as realistic and useful may include conducting experiments, running simulations, test-marketing a product or service, establishing small-scale pilot programs, building prototypes, and many other activities designed to verify that the new idea will work and is practical to implement. The goal is to subject the innovative idea to the test of cold, hard reality. At this phase, appropriate questions to ask include the following:

- Is it *really* a better solution to a particular problem or opportunity? Sometimes an idea that appears to have a bright future in the lab or on paper dims considerably when put to the test of reality.
- Will it work?
- Is there a need for it?
- If so, what is the best application of this idea in the marketplace?
- Does this product or service idea fit into our core competencies?
- How much will it cost to produce or to provide?
- Can we sell it at a reasonable price that will produce adequate sales, profit, and return on investment for our business?
- Will people buy it? Tom Ellingson and Dean Curtis, cofounders of Fandeavor, a business that helps sports fans' dreams come true (e.g., locker room and sideline access at a professional football game, tickets for pit row and meet-and-greet drivers at a NASCAR race, and others), kept their jobs at Zappos while they tested their business on a small scale. Fans responded enthusiastically to their business model and less than a year after starting Fandeavor, Ellingson and Curtis left Zappos and made their company (in which Zappos CEO Tony Hsieh invested $525,000) their full-time career.[104]

To test the value of his new drug formulation, Dr. Navia used powerful computers at Vertex Pharmaceuticals to build three-dimensional Tinkertoy-like models of the HIV virus and then simulated his new drug's ability to block the protease enzyme. Subsequent testing of the drug verified its safety. Dr. Navia was convinced he had an insight into solving the AIDS puzzle that no one else had discovered.

Step 7. Implementation

The focus of this step is to transform the idea into reality. Plenty of people come up with creative ideas for promising new products or services, but most never take them beyond the idea stage. What sets entrepreneurs apart is that they *act* on their ideas. An entrepreneur's philosophy is "Ready, aim, fire," not "Ready, aim, aim, aim, aim." Innowattech, a company based in Ra'anana, Israel, has developed a variety of piezoelectric (PE) crystals that possess the ability to transform vibrations, motion, and temperature changes into clean energy. Like miniature generators, the pressure-sensitive ceramic crystals give off small electrical charges when "squeezed, squashed, bent, or slapped," says Markys Cain, a materials scientist. In a recent test, Innowattech placed

PE generators two inches beneath a small section of Israel's busy Highway 4, where passing cars compressed the road, activated the tiny generators, and produced energy. The company estimates that placing the PE crystals under a one-half-mile stretch of highway would generate enough energy to supply 250 homes. Innowattech also has developed crystals for collecting clean energy from railways, airport runways, and pedestrian walkways. Pavegen Systems, a London-based company, has developed a similar technology for pedestrian walkways that captures the kinetic energy from passersby. Installed on a busy thoroughfare, the company's energy-absorbing pads (which are made from recycled material) can generate enough energy to power the area's lighting and signs.[105] The key to both companies' success is their ability to take a creative idea for a useful new product and turn it into a reality. As one creativity expert explains, "Becoming more creative is really just a matter of paying attention to that endless flow of ideas you generate, and learning to capture and act upon the new that's within you."[106]

For Dr. Navia and Vertex Pharmaceuticals, the implementation phase required testing the drug's ability to fight the deadly virus in humans. If it proved to be effective, Vertex would complete the process by bringing the drug to market. In this final phase of testing, Navia was so certain he was on the verge of a major breakthrough in fighting AIDS that he couldn't sleep at night. Unfortunately, the final critical series of tests proved that Dr. Navia's flash of creativity proved to be incorrect. Although his intuition proved to be wrong this time, Dr. Navia's research into fighting AIDS continues. Much of the current work at Vertex is based on Dr. Navia's original idea. Although it proved to be incorrect, his idea has served a valuable purpose: generating new ideas for HIV research.[107]

Techniques for Improving the Creative Process

LO7

Discuss techniques for improving the creative process.

Teams of people working together usually can generate more and more creative ideas. Five techniques that are especially useful for improving the quality of creative ideas from teams are brainstorming, mind mapping, force-field analysis, TRIZ, and rapid prototyping.

Brainstorming

brainstorming
a process in which a small group of people interact with very little structure with the goal of producing a large quantity of novel and imaginative ideas.

Brainstorming is a process in which a small group of people interact with very little structure with the goal of producing a large *quantity* of novel and imaginative ideas. The goal is to create an open, uninhibited atmosphere that allows members of the group to "freewheel" ideas. Participants should suggest any ideas that come to mind *without evaluating or criticizing them.* As group members interact, each idea sparks the thinking of others, and the spawning of ideas becomes contagious. The free-flowing energy generated by the team becomes the genesis of a multitude of ideas, some of which may be impractical; however, those impractical ideas may lead to one idea that results in a breakthrough product or service for a company. For a brainstorming session to be successful, entrepreneurs should follow these guidelines:

- Keep the group small—just five to eight members. Amazon founder Jeff Bezos uses the "two-pizza rule"—if a brainstorming group can eat two pizzas, it's too big.[108]
- Make the group as diverse as possible. Include people with different backgrounds, disciplines, and perspectives. At Joe Design Inc., every employee in the small firm takes part in brainstorming sessions. "We bring in everybody from the bookkeeper to the office manager because they see things completely differently than we do," says cofounder Joe Raia.[109]
- Encourage participants to engage in some type of aerobic exercise before the session. One study found that people who exercise—walking, bicycling, swimming, or running—before brainstorming sessions were more creative than those who did not exercise.[110]
- Ignore company rank and department affiliation. Every member of the brainstorming team is on equal ground.
- Give the group a well-defined problem. Stating the problem in the form of a "why," "how," or "what" question often helps.
- Rather than waste precious group meeting time getting participants up to speed, provide everyone involved in the session with relevant background material about the problem to

be solved beforehand. Invite participants to submit at least three ideas by e-mail before the brainstorming session takes place. This gets people's minds focused on the issue.

- Limit the session to 40 to 60 minutes. Beyond that, participants grow weary, and creativity flags because brainstorming is an intense activity.
- Take a field trip. Visit the scene of the problem, if possible. Research shows that brainstorming teams that go "on site" actually come up with more and better ideas.[111]
- Appoint someone (preferably not a brainstorming participant) the job of recorder. The recorder should write every idea on a flip chart or board so that everyone can see it.
- Use a seating pattern that encourages communication and interaction (e.g., circular or U-shaped arrangements).
- Throw logic out the window. The best brainstorming sessions are playful and anything but logical.
- Encourage *all* ideas from the team, even wild and extreme ones. Discourage participants from editing their ideas. Not only can ideas that initially seem crazy get the group's creative juices flowing, but they also can spread creativity like wildfire. In addition, the group often can polish some of these wild ideas into practical, creative solutions.
- Establish a goal of *quantity* of ideas over *quality* of ideas. There will be plenty of time later to evaluate the ideas generated. At Ideo Inc., a Silicon Valley design firm, brainstorming teams shoot for at least 150 ideas in a 30- to 45-minute session.[112] When chemist Linus Pauling received his second Nobel Prize, someone asked him how he came up with so many great ideas. Pauling replied simply, "I come up with lots of ideas."[113]
- *Forbid* evaluation or criticism of any idea during the brainstorming session. No idea is a bad idea. Criticism slams the brakes on the creative process instantly!
- Encourage participants to use "idea hitchhiking," building new ideas on those already suggested. Often, some of the best solutions are those that are piggybacked on others.
- Dare to imagine the unreasonable. Creative ideas often arise when people suspend conventional thinking to consider far-fetched solutions.

ENTREPRENEURIAL PROFILE: John Nottingham: Nottingham Spirk At Nottingham Spirk, an industrial design firm whose success depends on the creativity of its people, employees routinely use brainstorming to come up with new product ideas and designs. The focus of these sessions is to generate a large quantity of ideas, "from mild to wild," says cofounder John Nottingham, rather than to emphasize the quality of the ideas. By the end of the session, the walls are covered with pieces of paper containing scribbles, sketches, and notes, representing 100 or more ideas. Only after the brainstorming session do employees begin to focus on the quality of the ideas generated. In these meetings, employees judge each idea using a simple scale. Each person can display one of three cards: "Who Cares?" "Nice," and "Wow!" (All participants display their cards simultaneously.) A consensus of "Who Cares?" cards means that the group discards the idea, but a strong showing of "Wow!" cards means that the idea moves forward for refinement. A vote of "Nice" usually means that the idea goes back for more brainstorming, hopefully transforming it into a "Wow!" idea. An idea for a Christmas tree stand that uses a swivel joint and a locking pedal initially received a "Nice" rating from the group. The idea's champion kept tinkering with it, ultimately adding a self-regulating automatic watering device and other features before returning to the group. In its second pass, the idea went from "Nice" to "Wow!" Since 2002, the SwivelStraight tree stand has sold 1 million units.[114] ■

mind mapping
a graphical technique that encourages thinking on both sides of the brain, visually displays the various relationships among ideas, and improves the ability to view a problem from many sides.

Mind Mapping

Another useful tool for jump-starting creativity is **mind mapping**, an extension of brainstorming. One strength of mind mapping is that it reflects the way the brain actually works. Rather than throwing out ideas in a linear fashion, the brain jumps from one idea to another. In many creative sessions, ideas are rushing out so fast that many are lost if a person attempts to shove them into a

linear outline. Creativity suffers. Mind mapping is a graphical technique that encourages thinking on both sides of the brain, visually displays the various relationships among ideas, and improves the ability to view a problem from many sides.

The mind-mapping process works this way:

- Start by writing down or sketching a picture symbolizing the problem or area of focus in the center of a large blank page. Tony Buzan, originator of the mind-mapping technique, suggests using ledger paper or covering an entire wall with butcher paper to establish a wide-open attitude toward creativity.
- Write down *every* idea that comes into your mind, connecting each idea to the central picture or words with a line. Use key words and symbols to record ideas in shorthand. Work as quickly as possible for no more than 20 minutes, doing your best to capture the tide of ideas that flows from your brain. Just as in brainstorming, do not judge the quality of your ideas; just get them onto the paper. Build new ideas on the backs of existing ones. If you see a connection between a new idea and one already on the paper, connect them with a line. If not, simply connect the idea to the center symbol. You will organize your ideas later in the process.
- When the flow of ideas slows to a trickle, stop! Don't try to force creativity.
- Allow your mind to rest for a few minutes and then begin to integrate the ideas on the page into a mind map. Use colored pens and markers to connect ideas with similar themes or to group ideas into related clusters. As you organize your thoughts, look for new connections among your ideas. Sometimes the brain needs time to process the ideas in a mind map. (Recall the incubation stage of the creative process.) Walking away from the mind map and the problem for a few minutes or a few hours may lead to several new ideas or to new relationships among ideas. One entrepreneur created the format for his company's business plan with a mind map rather than with a traditional linear outline. When he finished, he not only knew what he should include in his plan but also had a clear picture of the order in which to sequence the elements.

Force-Field Analysis

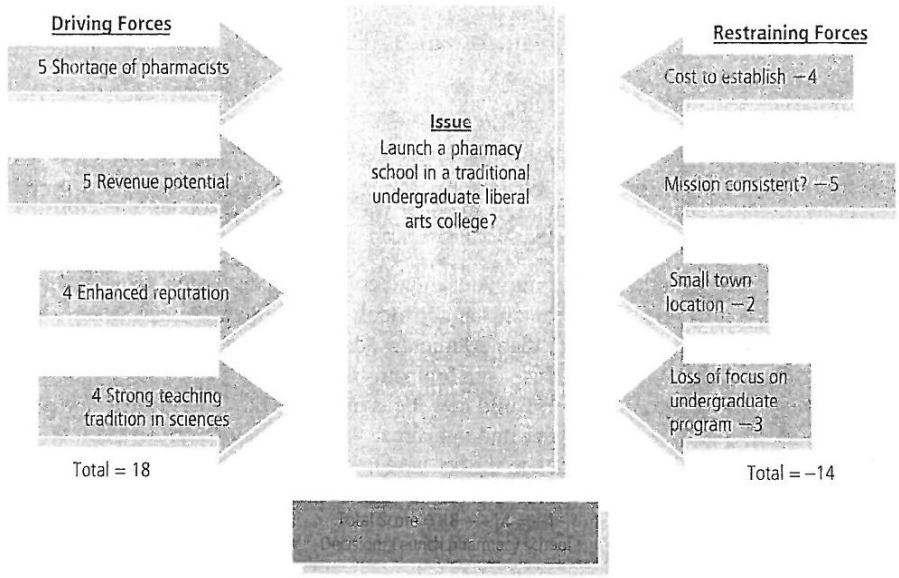
Force-field analysis is a useful technique for evaluating the forces that support and oppose a proposed change. It allows entrepreneurs to weigh both the advantages and the disadvantages of a particular decision and work to maximize the variables that support it and minimize those that work against it. The process, which, like brainstorming, works well with a group, begins by making three columns and listing the problem to be addressed in the center column. In the column on the left, the group should list driving forces, those that support the issue and move it forward. In the column on the right, the group should list the restraining forces, those that hold back the company from implementing the idea. The specific forces that the group may come up with are almost limitless, but some of the factors the team should consider include people, values, costs, trends, traditions, politics, costs, revenues, environmental impact, regulations, and attitudes.

Once the group has identified a reasonable number of driving and restraining forces (4 to 10 is typical), the next task is to assign a numerical value that reflects the strength of that particular force. For the driving forces column, scores range from 1 (weak) to 4 (strong), and in the restraining forces column, scores range from −1 (weak) to −4 (strong). Adding the scores for the driving forces column and the restraining forces column shows which set of forces dominates the issue. The higher the total score, the more feasible is the idea. If the decision is a "go," the group can focus on ideas to create new driving forces, strengthen existing driving forces, and minimize the impact of restraining forces.

Force-field analysis produces many benefits, particularly when it is combined with other creativity enhancing techniques. It helps entrepreneurs judge the practicality of a new idea, identify resources the company can use to bring the idea to market, recognize obstacles the company must overcome to implement the idea, and suggest ways to conquer those obstacles.

Figure 3.4 shows a sample force-field analysis for a small liberal arts college that is considering an entrepreneurial venture, launching a pharmacy school.

FIGURE 3.4
Sample Force-Field Analysis



TRIZ

Developed in 1946 by Genrich Altshuller, a 22-year-old naval officer in the former Soviet Union, TRIZ (pronounced "trees") is a systematic approach designed to help solve any technical problem, whatever its source. The name is derived from the acronym for the Russian phrase that translates as "theory of inventive problem solving." Unlike brainstorming and mind mapping, which are right-brain activities, TRIZ is a left-brain, scientific, step-by-step process that is based on the study of hundreds of the most innovative patents across the globe. Altshuller claimed that these innovations followed a particular set of patterns. Unlocking the principles behind those patterns allows one not only to solve seemingly insurmountable problems but also to predict where the next challenges would arise.

Altshuller and his colleagues developed 40 principles underlying these innovative patents and then developed the "TRIZ contradiction matrix," a tool that combines these principles to solve a problem. They recognized that innovations come about when someone is able to overcome the inherent contradictions in a process. For instance, in the packaging industry, a contradiction exists between the effectiveness of childproof safety caps for medicine containers and making those containers easy for authorized users to open. Manufacturers of mattresses face the contradiction of making mattresses that are both hard and soft. Too often, companies rely on a very unimaginative solution to contradictions such as these; they compromise. Rather than settle for a mediocre compromise, the TRIZ contradiction matrix is designed to *resolve* these conflicts using the 40 principles that Altshuller developed. One axis of the matrix displays the characteristic of the process to be improved, and the other axis displays the conflicting characteristic that is becoming worse.

For example, suppose that a candy maker wants to make syrup-filled, bottle-shaped chocolates by molding the chocolate bottles and then pouring syrup into the mold. To speed production of the finished product to meet demand, the business owner tries heating the syrup to allow for faster pouring, but the heated syrup melts the molded chocolate bottles and distorts their shape (the contradiction; see Figure 3.5). Using the TRIZ contradiction matrix, the candy maker recognizes the problem as a conflict between speed and shape. Speed is the characteristic to be improved, and shape is the characteristic that is getting worse. The principles that the matrix suggests for solving this problem include (1) changing the dynamics of the object or the environment (e.g., making a rigid part flexible), (2) discarding or recovering parts of an object (e.g., dissolving a protective case when it is no longer needed), (3) causing an object to vibrate or oscillate (e.g., transforming a standard knife into an electric knife by introducing oscillating blades), and (4) changing the properties of the object (e.g., freezing the chocolate syrup and then molding the bottles around the syrup).

Characteristic to be improved	Characteristic that is getting worse: Volume of stationary object	Speed	Force	Stress or pressure	Shape	Stability of the object
Volume of stationary object	—	*	Taking out Mechanical vibration Thermal expansion	Intermediary Parameter changes	Nested doll Taking out Parameter changes	Discarding and recovering Mechanics substitution Parameter changes Composite materials
Speed	*	—	The other way around Mechanics substitution Dynamics Periodic action	Universality Mechanical vibration Strong oxidants Composite materials	[illegible]	Mechanics substitution Homogeneity Segmentation Mechanical vibration
Force	Taking out Phase transitions Mechanical vibration Thermal expansion	The other way round Mechanics substitution Dynamics Equipotentiality	—	Mechanical vibration Skipping Beforehand cushioning	Preliminary action Parameter changes Composite materials Discarding and recovering	Parameter changes Preliminary action Skipping
Stress or pressure	Parameter changes Intermediary	Universality Parameter changes Phase transitions	Phase transitions Parameter changes Skipping	—	Parameter changes Asymmetry Dynamics Preliminary action	Parameter changes Homogeneity Taking out Composite materials
Shape	Nested doll Taking out Parameter changes	Parameter changes Discarding and recovering Mechanical vibration	Parameter changes Preliminary action Thermal expansion Composite materials	Discarding and recovering Dynamics Preliminary action Spheroidality and curvature	—	Homogeneity Segmentation Mechanical vibration Asymmetry

FIGURE 3.5

TRIZ Contradiction Matrix

Source: Based on, G. Altshuller, TRIZ 40, http://www.triz40.com/aff_Matrix.htm.

Choosing principle 4, the candy maker decides to change the properties of the chocolate syrup by adding a compound that causes it to solidify when exposed to air, making it easier and faster to coat with chocolate. Once enclosed inside the chocolate, the syrup once again becomes a liquid. Problem solved![115]

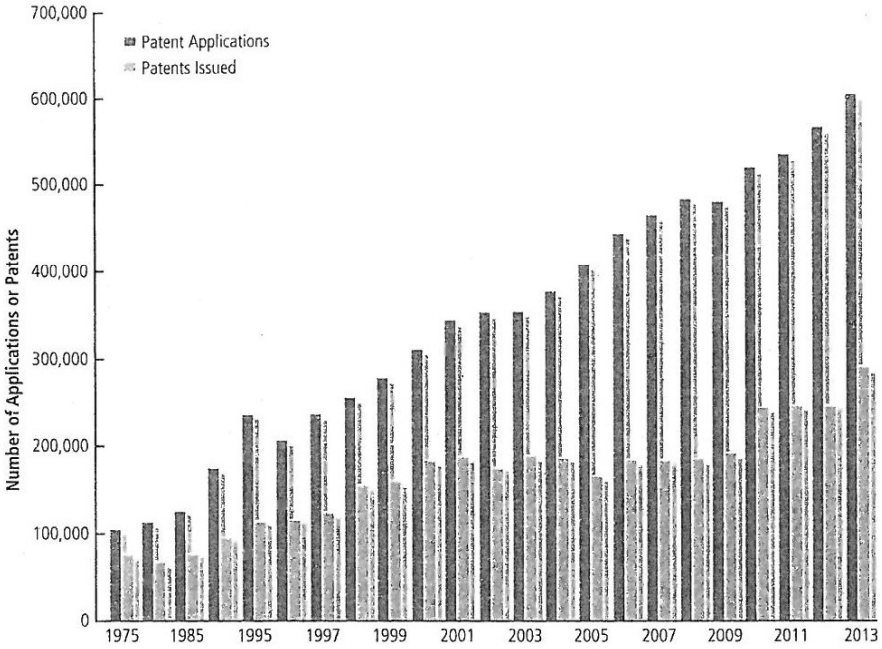
Rapid Prototyping

Generating creative ideas is a critical step in the process of taking an idea for a product or a service successfully to market. However, recall that many (perhaps most) ideas that entrepreneurs come up with fail. Inventor and serial entrepreneur Scott Jones says his kids still enjoy teasing him about one of his offbeat ideas that flopped: a pair of microturbines embedded in the soles of shoes that would propel the wearer forward. (Jones abandoned the idea after seeing a similar concept fail flamboyantly in the movie *Jackass*.)[116] Rapid prototyping plays an important part in the creative process because it serves as a way to screen ideas that are not practical or just won't work so that entrepreneurs can focus their creative energy on other ideas. The premise behind **rapid prototyping** is that transforming an idea into an actual model points out flaws in the original idea and leads to improvements in its design. "If a picture is worth a thousand words, a prototype is worth ten thousand," says Steve Vassallo of Ideo Inc.[117]

rapid prototyping
the process of creating a model of an idea, enabling an entrepreneur to discover flaws in the idea and to make improvements in the design.

FIGURE 3.6
Patent Applications and Patents Issued

Source: U.S. Patent and Trademark Office, 2014.

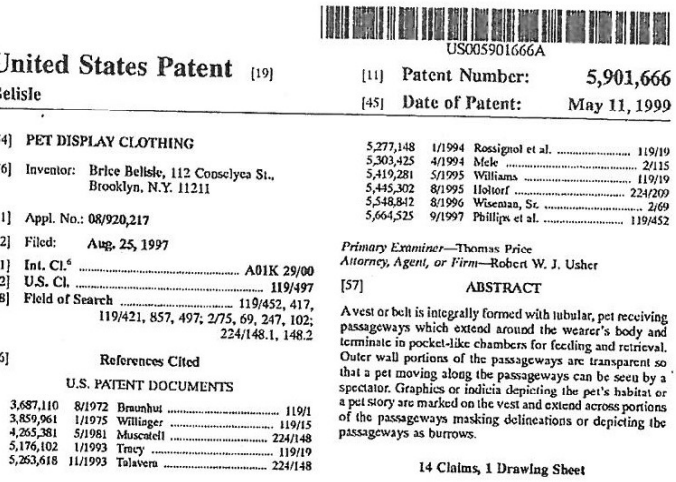


different from what has been used or described before and must not be obvious to a person having ordinary skill in the area of technology related to the invention.

Complete a patent application. If an inventor decides to seek a patent, he or she must file an application describing the invention with the PTO. The patent application must include specific *claims*, which describe the invention—what it does and how it works—and any drawings that are necessary to support the claims. The typical patent application runs 20 to 40 pages although some, especially those for biotech or high-tech products, are tens of thousands of pages long. The longest patent application to date is one for a gene patent that was 6 million pages long![126] Most inventors hire patent attorneys or agents to help them complete their patent applications. Figure 3.7 shows a portion of the application for a rather unusual patent. Inventors also can file a provisional application for a patent for a small fee. Filing for a provisional patent does not require the inventor to file any claims but does give him or her the right to use the phrase "patent pending" on the device. After filing for a provisional patent, an inventor has one year to file a standard patent application.

File the patent application. Before the PTO will issue a patent, one of its examiners studies the application to determine whether the invention warrants a patent. Approval of a patent takes on average 27.5 months from the date of filing.[127] If the PTO rejects the application, the inventor can amend his or her application and resubmit it to the PTO.

Defending a patent against "copycat producers" can be expensive and time consuming but often is necessary to protect an entrepreneur's interest. The number of patent infringement lawsuits has increased sharply. In 2009, patent holders filed 2,800 infringement suits; today, courts see nearly 5,200 patent suits per year. The median time for a patent infringement case to get to trial is 2.3 years. The median cost of a patent infringement lawsuit when the amount in dispute is between $1 million and $25 million is about $2.65 million if the case goes to trial (about 95 percent of patent infringement lawsuits are settled out of court), but the odds of winning are in the patent holder's favor. About two-thirds of patent holders win their infringement suits; since 2007, the median award is $4.95 million, which is most often based on the royalties lost to the infringer.[128] Canada Goose is a company started in 1957 in Toronto, Ontario, that manufactures high-quality, down-insulated vests and coats designed to protect people who wear the company's products from the mind-numbing cold of Antarctica or the gale-force winds on the North Sea. Recently, Canada Goose managers discovered knockoffs of its products that look like the real items but contain no down insulation at all. Instead, the counterfeit garments, many of which are made in the Far East using child labor, are filled with unsanitary, bacteria-laden materials that



US005901666A

United States Patent [19]
Belisle

[11] **Patent Number: 5,901,666**
[45] **Date of Patent: May 11, 1999**

[54] **PET DISPLAY CLOTHING**

[76] Inventor: Brice Belisle, 112 Conselyea St., Brooklyn, N.Y. 11211

[21] Appl. No.: 08/920,217

[22] Filed: Aug. 25, 1997

[51] Int. Cl.[6] A01K 29/00
[52] U.S. Cl. 119/497
[58] Field of Search 119/452, 417, 119/421, 857, 497; 2/75, 69, 247, 102; 224/148.1, 148.2

[56] References Cited

U.S. PATENT DOCUMENTS

3,687,110	8/1972	Braunhut	119/1
3,859,961	1/1975	Willinger	119/15
4,265,381	5/1981	Muscatell	224/148
5,176,102	1/1993	Tracy	119/19
5,263,618	11/1993	Talavera	224/148
5,277,148	1/1994	Rossignol et al.	119/19
5,303,425	4/1994	Mele	2/115
5,419,281	5/1995	Williams	119/19
5,445,302	8/1995	Holtorf	224/209
5,548,842	8/1996	Wiseman, Sr.	2/69
5,664,525	9/1997	Phillips et al.	119/452

Primary Examiner—Thomas Price
Attorney, Agent, or Firm—Robert W. J. Usher

[57] ABSTRACT

A vest or belt is integrally formed with tubular, pet receiving passageways which extend around the wearer's body and terminate in pocket-like chambers for feeding and retrieval. Outer wall portions of the passageways are transparent so that a pet moving along the passageways can be seen by a spectator. Graphics or indicia depicting the pet's habitat or a pet story are marked on the vest and extend across portions of the passageways masking delineations or depicting the passageways as burrows.

14 Claims, 1 Drawing Sheet

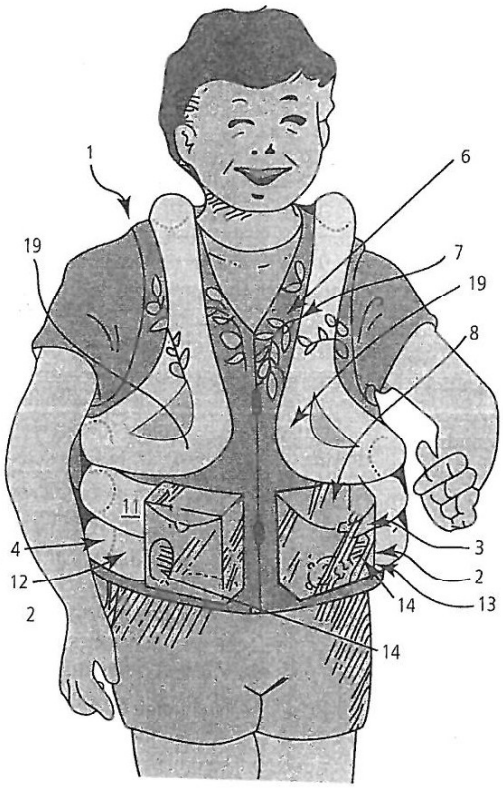


FIGURE 3.7

A Sample (and Unusual) Patent for Pet Display Clothing

Source: The United States Patent and Trademark Office, an Agency of the Department of Commerce, United States Government, Washington, DC.

offer no protection against the elements. Halting sales of counterfeit items can be difficult, but CEO Dani Reiss, whose grandfather founded the company, says Canada Goose "employs legal teams all over the world to intercept [counterfeit] shipments." Recently, Canada Goose was successful in shutting down a business that was importing counterfeit jackets bearing its labels and selling them to unsuspecting customers in Sweden. To verify the authenticity of its products, the company recently began adding a hologram to every jacket.[129] With its global reach and speedy convenience, the Internet compounds the problem of counterfeit sales, especially among brand-name products such as shoes, consumer electronics, handbags, apparel, watches, computers, and others. Ninety-three percent of counterfeit goods originate in China and Hong Kong.[130]

Trademarks

A **trademark** is any distinctive word, phrase, symbol, design, name, logo, slogan, or trade dress that a company uses to identify the origin of a product or to distinguish it from other goods

trademark
any distinctive word, phrase, symbol, design, name, logo, slogan, or trade dress that a company uses to identify the origin of a product or to distinguish it from other goods on the market.

You Be the Consultant

How Would You Rule in These Intellectual Property Cases?

Companies in the fashion industry typically defend their trademarks aggressively but traditionally have not relied on patents to protect their intellectual property because few legal protections for clothing designs exist. Fashion designers constantly come up with new designs for garments but find that protecting, say, the shape of a lapel or the cut of a cuff, is difficult because clothing is functional and not "novel, useful, and not obvious" in light of current technology, which receiving a patent requires. Fashion companies usually look to trademarks to protect their brands.

Christian Louboutin SA v. Yves Saint Laurent SA. French luxury shoemaker Christian Louboutin (CL) recently filed a trademark infringement lawsuit against Yves Saint Laurent (YSL), claiming that CL had the right to trademark protection for the "China red" soles the company uses on all of its high heel shoes and that YSL had violated its trademark by introducing a line of "monochrome" high heel shoes in which the red shoes had red soles. CL's attorney argued that Louboutin's use of the red soles had transformed an everyday item, the sole of a shoe, into a work of art and created a well-recognized trademark. "The red sole has become synonymous with Christian Louboutin and high fashion," the company pointed out in its complaint. "Louboutin turned a pedestrian item into a thing of beauty." Celebrities such as Scarlett Johansson, Oprah Winfrey, Gwyneth Paltrow, Halle Berry, Beyoncé, Christina Aguilera, and many others, often sport "Loubs." CL also pointed out that other companies have trademark protection for certain colors, such as Tiffany and Company's robin-egg blue boxes, United Parcel Service's brown trucks and uniforms, and Owens-Corning's pink insulation.

Winning a trademark for color has proven to be more difficult in the fashion industry, where color is a fundamental part of almost any design. That principle became the foundation of YSL's argument. YSL's attorney countered by citing a judge's ruling in a similar case that said, "Granting a producer the exclusive use of a basic element of design (shape, material, color, and so forth) impoverishes other designers' palettes." YSL went on to argue that "allowing Louboutin to claim a monopoly on the use of red on a part of the shoe would have an unprecedented, anti-competitive effect in limiting the design options available to all other designers."

After hearing the parties' arguments, Judge Victor Marrero, a district court judge in New York, ruled in favor of Yves Saint Laurent. "Louboutin's claim would cast a red cloud over the whole industry, cramping what other designers could do while allowing Louboutin to paint with a full palette," he wrote. "Color constitutes a critical attribute of the goods." His ruling meant that Christian Louboutin could not claim trademark protection for its red-soled shoes. Attorneys for Christian Louboutin filed an appeal with the Second Circuit U.S. Court of Appeals with the intent of having the appeals court reverse the trial court's decision.

Lulumon Athletica Inc. v. Calvin Klein Inc. Lulumon, a maker of yoga apparel based in Vancouver, British Columbia, filed a complaint in a district court in Delaware, claiming that Calvin Klein Inc. (CKI) was selling yoga pants that infringed on three of the company's design patents, including one that included a distinctive waistband made of three overlapping panels of fabric that the company received in 2011. Unlike a utility patent, a design patent protects an item's nonfunctional, ornamental features. To receive a design patent, a product must include the following five elements:

1. The item must be an "article of manufacture."
2. The design must be original.
3. The design must be novel.
4. The design must be non-obvious.
5. The design must be ornamental.

With its three overlapping pieces of Lulumon's trademarked Luon compression fabric, the waistband on the company's Astro yoga pants, which retail for $98, is designed to make the waist look slimmer and, because they can be rolled down to sit lower on the waist, enhance the wearer's athletic performance. Lulumon claimed that the waistband on CKI's yoga pants, which sell for as little as $20, is substantially similar to the waistband on its Astro yoga pants. According to a decision in 2008 by the U.S. Court of Appeals for the Federal Circuit, owners of design patents must prove that to the average observer the alleged infringer's design appears to be substantially the same as its own design (known as the "ordinary observer test").

1. What does a trademark protect? What does a patent protect? What is a design patent?
2. Assume the role of a judge in these two cases. How would you rule? Explain your reasoning. (In the Lulumon Athletica v. Calvin Klein case, you may want to search online for images of the two companies' yoga pants and apply the ordinary observer test before making your decision.)
3. Use a search engine to research the outcomes of these two cases. How were the cases resolved? If a judge rendered a decision, summarize his or her reasoning. Do you agree with the judge's decision?

Sources: Based on Tim Sablik, "Can Creativity and Copying Coexist?" *Region Focus*, Fourth Quarter, 2011, p. 24; Ashby Jones, "The Red Sole Case," *Wall Street Journal*, January 25, 2012, pp. B1–B2; Ray A. Smith and Ashby Jones, "Color Wars: Luxury Makers Battle Over Red-Soled Shoes," *Wall Street Journal*, August 11, 2011, pp. B1, B8; Chad Bray, "Red-Soled Shoes Win Appeal," *Wall Street Journal*, September 6, 2012, p. B10; Ashby Jones, "Downward Docket: The Yoga Pants War," *Wall Street Journal*, September 12, 2012, pp. B1, B5; "Lulumon Settles Yoga Pants Lawsuit with Calvin Klein," *CBC News*, November 21, 2012, http://www.cbc.ca/news/business/lululemon-settles-yoga-pants-patent-lawsuit-with-calvin-klein-1.1183253; Cory Howard, "Lulumon's Yoga-Pant Waistband Stretches the Limits of Design Patent Protection," *Jurist*, October 25, 2012, http://www.cbc.ca/news/business/lululemon-settles-yoga-pants-patent-lawsuit-with-calvin-klein-1.1183253; "Lulumon Settles Patent Dispute with Calvin Klein," *Jurist*, November 22, 2012, http://jurist.org/paperchase/2012/11/lululemon-settles-patent-dispute-with-calvin-klein.php.; Complaint at page 9, Christian Louboutin v Yves Saint Laurent, No. 11-cv-2381, United States District Court, Southern District Court of New York, April 7, 2011; Complaint at page 2, Defendants/Counterclaim Plaintiffs' Memorandum of Law in Opposition to Motion for Preliminary Injunction, No. 11-cv-2381, United States District Court of New York, July 12, 2011.

"Yeah, Org invented the wheel, but I invented the patent."

Larry Lambert/www.CartoonStock.com

on the market. (A **service mark** is the same as a trademark except that it identifies and distinguishes the source of a service rather than a product.) A trademark serves as a company's "signature" in the marketplace. A trademark can be more than just a company's logo, slogan, or brand name; it can also include symbols, shapes, colors, smells, or sounds. For instance, Coca-Cola holds a trademark on the shape of its bottle, and Owens-Corning has trademarked the unique pink color of its insulation. NBC owns a "sound mark," the auditory equivalent of a trademark, on its three-toned chime, and MGM has similar protection on the roar of the lion (whose name is Leo) that appears at the beginning of its movies.[131] *Trademark infringement* involves using another company's trademark without permission or using a mark that is so similar to another's trademark that it is likely to create confusion about the origin of the goods. Trademark owners file about 3,600 infringement lawsuits per year.[132]

service mark
offers the same protection as a trademark but identifies and distinguishes the source of a service rather than a product.

ENTREPRENEURIAL PROFILE: Heath Scurfield and Calli Baker's Firehouse Bar & Grill Firehouse Subs, a chain of fast-food submarine sandwich shops with more than 450 locations across the United States, filed a trademark infringement suit against Heath Scurfield, a retired firefighter who owns Calli Baker's Firehouse Bar & Grill, claiming that his use of the word "firehouse" in his company's name was likely to confuse customers into believing that his restaurant was affiliated with the national chain. Scurfield argued that the only similarity between his independent, full-service restaurant, which features lunch and dinner entrees, a bar, and a catering service, and the Firehouse Subs chain is the inclusion of the word "firehouse" in their names and the firehouse decor. After three years of legal wrangling, a jury ruled in Scurfield's favor and invalidated Firehouse Subs' trademark because it filed a fraudulent trademark application in 2003, claiming that at the time no other restaurants were using the word "firehouse" in their names when, in reality, the company knew that many restaurants included "firehouse" in their names. Firehouse Subs appealed the ruling, and the parties ultimately entered into a court-approved settlement under which Scurfield would continue to use his company's name and Firehouse Subs would not renew its trademark and would pay all of Scurfield's legal fees, which amounted to hundreds of thousands of dollars.[133] ■

Components of a product's identity are part of its **trade dress**, the unique combination of elements that a company uses to create a product's image and to promote it. For instance, a Mexican restaurant chain's particular decor, color schemes, design, and overall "look and feel" constitute

trade dress
the unique combination of elements that a company uses to create a product's image and to promote it.

its trade dress. To be eligible for trademark protection, trade dress must be inherently unique and distinctive to a company, and another company's use of that trade dress must be likely to confuse customers.

There are 1.88 million trademarks registered and in active use in the United States (see Figure 3.8).[134] Federal law permits a company to register a trademark, which prevents other companies from employing a similar mark to identify their goods. Before 1989, a business could not reserve a trademark in advance of use. Today, the first party who either uses a trademark in commerce or files an application with the PTO has the ultimate right to register that trademark. Before attempting to register a trademark, an entrepreneur must conduct a search to verify that it is not already in use or is too similar to an existing mark. BizFilings' Trademark Explorer is a handy, low-cost tool for conducting trademark searches. Registering a trademark takes an average of 10.3 months from the time an entrepreneur submits the application.[135] Unlike patents and copyrights, which are issued for limited amounts of time, trademarks last indefinitely as long as the holder continues to use it. However, between 5 and 6 years after a trademark's registration date (and again between 9 and 10 years after the registration date and every 10 years after that), an entrepreneur must file an affidavit of use with the PTO. A trademark cannot keep competitors from producing the same product or selling it under a different name; it merely prevents others from using the same or confusingly similar trademark for the same or similar products.

Many business owners are confused by the use of the symbols ™ and ®. Anyone who claims the right to a particular trademark (or service mark) or has filed a trademark application can use the ™ (or SM) symbol. The claim to that trademark or service mark may or may not be valid, however. Only those businesses that have *registered* their marks with the PTO can use the ® symbol. Entrepreneurs do not have to register trademarks or service marks to establish their rights to those marks; however, registering a mark with the PTO does give entrepreneurs greater power to protect their marks. Filing an application to register a trademark or service mark costs from $275 to $375 and is relatively easy, but it does require a search of existing names.

An entrepreneur may lose the exclusive right to a trademark if it loses its unique character and becomes a generic name. Aspirin, escalator, thermos, brassiere, super glue, corn flakes, yo-yo, and cellophane all were once enforceable trademarks that have become common words in the English language. These generic terms can no longer be licensed as trademarks.

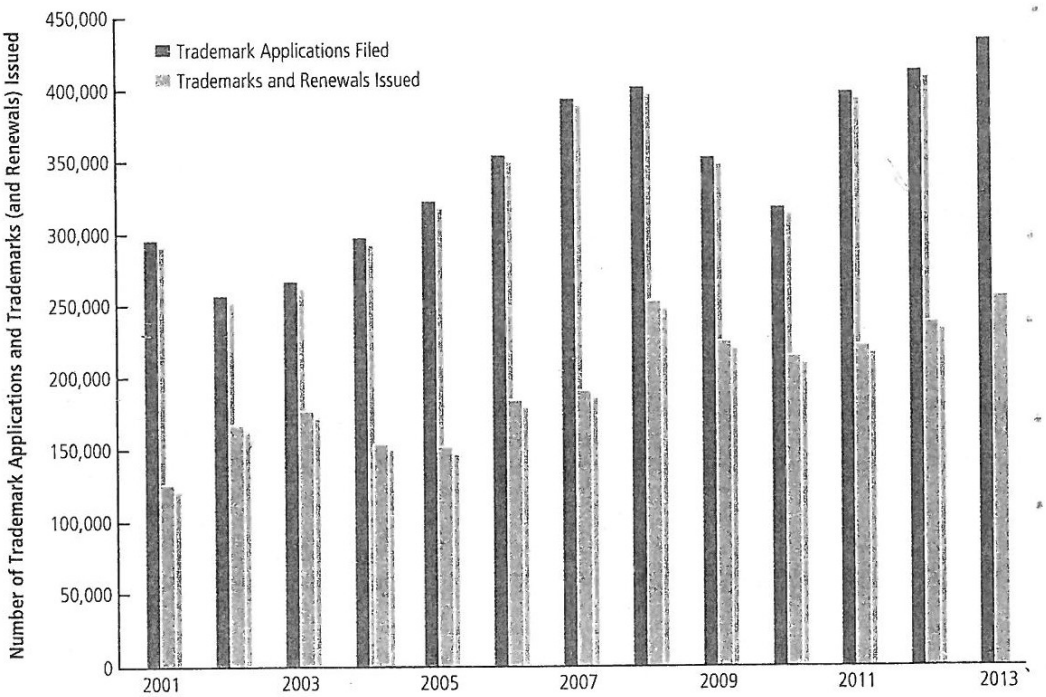


FIGURE 3.8
Trademark Applications and Trademarks and Renewals Issued

Source: US Patent and Trademark Office, 2014.

Hands On . . . How To

Protect Your Company's Intellectual Property—Both at Home and Abroad

In 2004, Thomas Dempsey started a company, SylvanSport, in Brevard, North Carolina, to sell a unique recreational camper trailer he invented and patented. SylvanSport marketed the trailer as "more versatile than a Swiss army knife" because it folds into a trailer that can carry boats, bikes, and other gear and, once onsite, convert in minutes into a camper with a self-inflating mattress and tent. By 2011, the company's annual sales had reached $3 million, 15 percent of which came from outside the United States, particularly South Korea, Japan, and Australia. With international sales growth outpacing domestic sales growth, Dempsey saw a bright future for his company.

Then he received an e-mail from a customer that included a link to the Web site of a Chinese company, Wuyi Tiandi Motion Apparatus, that was selling a camper trailer almost identical to the one he had designed. "We were shocked," says Dempsey. "We thought at first that what we saw was our product, but we realized that [their product] was created from scratch."

Since then, several of Dempsey's international distributors in Asia have dropped SylvanSport's camper and are selling the Chinese company's product. A Japanese distributor mistakenly purchased the Chinese company's camper, thinking it was buying one of SylvanSport's products. Thomas Tang, sales manager for Wuyi Tiandi, admits that SylvanSport was the first company "to make this type of trailer, and we followed them to make a similar product." Although Wuyi Tiandi cannot sell its camper in the United States because of SylvanSport's patent, "we can still sell our trailer everywhere else [in the world]," says Tang. Dempsey is concerned about the sales his company has lost to its Chinese competitor. "There's a very real chance that the Chinese company could be the survivor here and we could go out of business," he says matter-of-factly.

Thomas Dempsey took the proper steps to protect his intellectual property by securing a utility patent for his unique camper trailer in the United States. Like many entrepreneurs in today's global economy, Dempsey is conducting business internationally, where his U.S. patent offers no protection. What lessons can entrepreneurs learn from Dempsey's experience about protecting their intellectual property?

1. ***Recognize that intellectual property, the rights that result when a person uses his or her knowledge and creativity to produce something of value, can be a business's most valuable asset, even for small companies.*** Often intellectual property is the source of a company's competitive advantage. Experts estimate that in the United States alone, 30 to 40 percent of all gains in productivity over the course of the twentieth century originated with intellectual property. The World Intellectual Property Organization estimates that the value of the intellectual property of companies in the United States is $5.8 trillion.

2. ***Use the appropriate tool to file for protection of your intellectual property and do so promptly.*** The processes of filing for a patent, a trademark, and a copyright are different; make sure you know what each tool protects, which one is right for you, and how to get maximum protection from it for your intellectual property. You may be able to apply for more than one type of protection. For instance, an entrepreneur may be able to trademark a company logo and, if it is a form of artistic expression, copyright it as well.

3. ***Use qualified, experienced intellectual property attorneys to gain the proper protection.*** The time to involve attorneys in protecting the product of your knowledge and creativity is *before* you have to bring them in to take action against someone who has stolen your intellectual property. Filing for patents, trademarks, and copyrights can be intimidating if you have never done it before, and doing it incorrectly may mean that you have no protection at all. Attorneys, consultants, examiners, and other professionals specialize in the various types of intellectual property protection. Use their expertise! They can refer you to patent draftspeople (who create the sketches required for a patent application), design engineers, manufacturers, and others.

4. ***If you do business globally, register your company's patents, trademarks, and copyrights in the countries in which you do business or that are a strategic part of your business.*** Once an entrepreneur has made the proper filings to protect his or her intellectual property in the United States, the next step is to file for protection in the countries in which the company does business and in countries that are strategically important to the business. Only 15 percent of companies that do business internationally realize that U.S. patents and trademarks do *not* protect their intellectual property outside the borders of the United States. Although enforcing intellectual property laws in some countries can be difficult, the chances that you will be successful rise significantly if you have registered your IP with the proper offices in those nations. Most nations grant patents and trademarks to the first person or business to file. Inventors file more than 2 million patent applications globally each year, and 2011 marked the first time that businesses and entrepreneurs filed more patents in China than in any other country in the world. Businesses also file more than 4 million applications for trademarks globally each year.

   Filing to protect intellectual property rights in many individual countries can be expensive and time-consuming. Fortunately, when applying for trademarks, entrepreneurs benefit from important shortcuts: international registration

(continued)

Hands On . . . How To *(continued)*

and a community trademark. Entrepreneurs can file an international registration in all 86 nations that participate in the Madrid Protocol with an application in their home nations that they extend to the other 85 nations (although they must pay a registration fee in each country). Entrepreneurs who register a community trademark file a single application and pay a single fee that grants trademark protection in all 28 countries that belong to the European Union. In 2007, the patent offices in the United States, the European Union, and Japan created a common patent application that allows entrepreneurs to streamline the patent process by filing a single application for each country's patent office.

5. ***Select your company's business affiliates, especially suppliers, carefully.*** Companies in some countries have little concern for others' intellectual property. Some suppliers in foreign countries see no problem manufacturing goods for a business and then running an extra shift to produce the same goods that they themselves sell. In China, which is famous for its copycat culture, the term *shanzai* describes companies' tendency to copy the successful products of other businesses. Entrepreneurs should take extra precautions to ensure that they secure proper protection for their intellectual property before forging relationships with foreign manufacturers, especially those in Asia.
6. ***Protect your rights vigorously.*** If you discover that someone is using your intellectual property without permission, pursue your rights vigorously. Recognize that the costs of taking legal action, especially in foreign lands, may outweigh the benefits, at least in the short run. Entrepreneurs must decide whether pursuing costly legal action to protect their intellectual property rights will yield long-term benefits. A "head-in-the-sand" approach never works. After registering their trademarks and filing for patents in foreign countries, entrepreneurs must monitor them carefully and avidly prosecute violators of their intellectual property rights.

Sources: Based on *World Intellectual Property Indicators*, World Intellectual Property Organization, 2012, p. 3; Kathy Chu, "Chinese Copycats Challenge U.S. Small Businesses," *USA Today*, March 18, 2012, http://usatoday30.usatoday.com/money/smallbusiness/story/2012-03-15/china-copycats-patents/53614902/1; Carolyn Surh, "Staying Ahead of Copy Cats," *QSR*, March 2012, http://www.qsrmagazine.com/reports/staying-ahead-copy-cats; "How to Protect Your Trademark Internationally," *Business News Daily*, July 13, 2012, http://www.businessnewsdaily.com/2838-how-to-protect-your-trademark-internationally.html; David Hirschmann, "Intellectual Property Theft: Big Problem, Real Solutions, *The ChamberPost*, March 2008, http://www.chamberpost.com/2008/03/intellectual-pr.html; Merrill Matthews Jr. and Tom Giovanetti, "Why Intellectual Property Is Important," *Ideas*, Institute for Policy Innovation, July 8, 2002, p. 1; and Nichole L. Torres, "Getting Intellectual," *Entrepreneur*, December 2007, p. 110.

Copyrights

copyright
an exclusive right that protects the creators of original works of authorship, such as literary, dramatic, musical, and artistic works.

A **copyright** is an exclusive right that protects the creators of original works of authorship, such as literary, dramatic, musical, and artistic works (e.g., art, sculptures, literature, software, music, videos, video games, choreography, motion pictures, recordings, and others). The internationally recognized symbol © denotes a copyrighted work. A copyright protects only the form in which an idea is expressed, not the idea itself. A copyright on a creative work comes into existence the moment its creator puts that work into a tangible form. Just as with a trademark, obtaining basic copyright protection does *not* require registering the creative work with the U.S. Copyright Office (www.copyright.gov).

Registering a copyright does give creators greater protection over their work, however. Entrepreneurs must file copyright applications with the Copyright Office in the Library of Congress for a fee of $35 to $65 per application (plus recording fees). The mean processing time for a copyright application is 94 days.[136] A valid copyright on a work lasts for the life of the creator plus 70 years after his or her death. When a copyright expires, the work becomes public property and can be used by anyone free of charge.

Because they are so easy to duplicate, computer software programs, CDs, and DVDs are among the most often pirated items by copyright infringers. The Business Software Alliance estimates that the global software piracy rate is 42 percent and that the software industry loses $63.4 billion each year to pirates who illegally copy programs.[137] The motion picture industry loses billions of dollars annually to those who forge counterfeit movies and sell them. Immigration and Customs Enforcement officials recently disabled nine Web sites that were selling downloads of pirated movies, in some cases just hours after the films premiered in theaters.[138]

Table 3.3 provides a summary of the characteristics of patents, trademarks, and copyrights.

Protecting Intellectual Property

Acquiring the protection of patents, trademarks, and copyrights is useless unless an entrepreneur takes action to protect those rights in the marketplace. Unfortunately, not every businessperson respects others' rights of ownership to products, processes, names, and works, and some infringe on those rights with impunity. In other cases, the infringing behavior simply is the result of a

TABLE 3.3 **Characteristics of Patents, Trademarks, and Copyrights**

Protection	What It Protects	Who Is Eligible	Length of Protection	Approximate Cost
Utility Patent	Exclusive right to make, use, and sell an invention	First person to file for a patent	20 years	$4,000 to $25,000, depending on complexity
Design Patent	New, original changes in the design of existing products that enhance their sales	First person to file for a patent	14 years	$4,000 to $25,000, depending on complexity
Trademark	Any distinctive word, phrase, symbol, design, name, logo, slogan, or trade dress that a company uses to identify the origin of a product or to distinguish it from other goods on the market	Entity currently using the mark in commerce or one who intends to use it within six months	Renewable between 5th and 6th years and 9th and 10th years and every 10 years afterward	$1,000 to $2,500
Service mark	Same protection as a trademark except that it identifies and distinguishes the source of a service rather than a product	Entity currently using the mark in commerce or one who intends to use it within six months	Renewable between 5th and 6th years and 9th and 10th years and every 10 years afterward	$1,000 to $2,500
Copyright	Original works of authorship, such as literary, dramatic, musical, and artistic works	Author or creator	Life of the author or creator plus 70 years	$140 to $200

Source: Based on "Idea Factories," *Inc.*, September 2013, pp. 104–105.

lack of knowledge about others' rights of ownership. After acquiring the proper legal protection through patents, copyrights, or trademarks, entrepreneurs must monitor the market (and the Internet in particular) for unauthorized copycat users. If an entrepreneur has a valid patent, trademark, or copyright, stopping an infringer usually requires nothing more than a stern "cease-and-desist" letter from an attorney. Often, offenders don't want to get into expensive legal battles and agree to stop their illegal behavior. If that tactic fails, the entrepreneur may have no choice but to bring an infringement lawsuit, most of which end up being settled out of court.

The primary weapon an entrepreneur has to protect patents, trademarks, and copyrights is the legal system. The major problem with relying on the legal system to enforce ownership rights, however, is the cost and time of infringement lawsuits, which can quickly exceed the budget of most small businesses and occupy huge blocks of managers' time. Lawsuits always involve costs. Before pursuing what could become an expensive and drawn-out legal battle, an entrepreneur must consider the following issues:

- Can the opponent afford to pay if you win?
- Do you expect to get enough from the suit to cover the costs of hiring an attorney and preparing a case?
- Can you afford the loss of time, money, and privacy from the ensuing lawsuit?

Chapter Summary by Learning Objective

1. Explain the differences among creativity, innovation, and entrepreneurship.

- The entrepreneur's "secret" for creating value in the marketplace is applying creativity and innovation to solve problems and to exploit opportunities people face every day. Creativity is the ability to develop new ideas and to discover new ways of looking at problems and opportunities. Innovation is the ability to apply creative solutions to those problems and opportunities to enhance or to enrich people's lives. Entrepreneurship is the result of a disciplined, systematic process of applying creativity and innovation to needs and opportunities in the marketplace.

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2. Describe why creativity and innovation are such an integral part of entrepreneurship.

- Entrepreneurs must always be on guard against paradigms—preconceived ideas of what the world is, what it should be like, and how it should operate—because they are logjams to creativity. Successful entrepreneurs often go beyond conventional wisdom as they ask, "Why not?"
- Success—even survival—in this fiercely competitive, global environment requires entrepreneurs to tap their creativity (and that of their employees) constantly.

3. Understand how the two hemispheres of the human brain function and what role they play in creativity.

- For years, people assumed that creativity was an inherent trait. Today, however, we know better. Research shows that almost anyone can learn to be creative. The left hemisphere of the brain controls language, logic, and symbols, processing information in a step-by-step fashion. The right hemisphere handles emotional, intuitive, and spatial functions, processing information intuitively. The right side of the brain is the source of creativity and innovation. People can learn to control which side of the brain is dominant in a given situation.

4. Explain the 10 "mental locks" that limit individual creativity.

The number of potential barriers to creativity is limitless, but entrepreneurs commonly face 10 "mental locks" on creativity: Searching for the one "right" answer, focusing on "being logical," blindly following the rules, constantly being practical, viewing play as frivolous, becoming overly specialized, avoiding ambiguity, fearing looking foolish, fearing mistakes and failure, and believing that "I'm not creative."

5. Understand how entrepreneurs can enhance the creativity of their employees as well as their own creativity.

- Entrepreneurs can stimulate creativity in their companies by expecting creativity, expecting and tolerating failure, encouraging curiosity, viewing problems as challenges, providing creativity training, providing support, rewarding creativity, and modeling creativity.
- Entrepreneurs can enhance their own creativity by using the following techniques: allowing themselves to be creative, giving their minds fresh input every day, keeping a journal handy to record their thoughts and ideas, reading books on stimulating creativity or taking a class on creativity, and taking some time off to relax.

6. Describe the steps in the creative process.

- The creative process consists of seven steps: Step 1, preparation, involves getting the mind ready for creative thinking; step 2, investigation, requires the individual to develop a solid understanding of the problem or decision; step 3, transformation, involves viewing the similarities and the differences among the information collected; step 4, incubation, allows the subconscious mind to reflect on the information collected; step 5, illumination, occurs at some point during the incubation stage when a spontaneous breakthrough causes "the light bulb to go on"; step 6, verification, involves validating the idea as accurate and useful; and step 7, implementation, involves transforming the idea into a business reality.

7. Discuss techniques for improving the creative process.

- Five techniques are especially useful for improving the creative process:
  - Brainstorming is a process in which a small group of people interact with very little structure with the goal of producing a large *quantity* of novel and imaginative ideas.
  - Mind mapping is a graphical technique that encourages thinking on both sides of the brain, visually displays the various relationships among ideas, and improves the ability to view a problem from many sides.
  - Force-field analysis allows entrepreneurs to weigh both the advantages and the disadvantages of a particular decision and work to maximize the variables that support it and minimize those that work against it.
  - TRIZ is a systematic approach designed to help solve any technical problem, whatever its source. Unlike brainstorming and mind mapping, which are right-brain activities, TRIZ is a left-brain, scientific, step-by-step process that is based on the study of hundreds of the most innovative patents across the globe.
  - Rapid prototyping is based on the premise that transforming an idea into an actual model will point out flaws in the original idea and will lead to improvements in its design.

8. Describe the protection of intellectual property through patents, trademarks, and copyrights.

- A patent is a grant from the federal government that gives an inventor exclusive rights to an invention for 20 years.

- A trademark is any distinctive word, symbol, or trade dress that a company uses to identify its product and to distinguish it from other goods. It serves as a company's "signature" in the marketplace.
- A copyright protects original works of authorship. It covers only the form in which an idea is expressed and not the idea itself and lasts for 70 years beyond the creator's death.

Discussion Questions

3-1. Explain the differences among creativity, innovation, and entrepreneurship.
3-2. Being creative is important for every organization. Define creativity.
3-3. Why are creativity and innovation so important to the survival and success of a business?
3-4. "Anyone can learn to be creative." Discuss if this is true or false.
3-5. Successful entrepreneurs are willing to take risks, explore new ideas, and ask questions when required. Discuss if you agree or not.
3-6. How does the human brain function?
3-7. What operations does each hemisphere of the brain specialize in?
3-8. Which hemisphere is the "seat" of creativity?
3-9. Briefly outline the 10 "mental locks" that can limit individual creativity. Give an example of a situation in which you subjected yourself to one of these mental locks.
3-10. What can entrepreneurs do to stimulate their own creativity and to encourage it among workers?
3-11. Explain the steps of the creative process.
3-12. Why is there a need to hire a diverse workforce in order to promote a culture of creativity in the organization?
3-13. What can an entrepreneur do to enhance each step of the creative process?
3-14. Explain the differences among a patent, a trademark, and a copyright.
3-15. What form of intellectual property do patents, trademarks, and copyrights protect?

Beyond the Classroom . . .

3-16. You have a business presentation at your client's office in five minutes and you just realized that you have left your presentation documents in your office. In order to maintain your reputation in front of your client, you will be required to tackle this problem with maximum creativity. Generate as many solutions as possible by brainstorming with your business partner(s).

3-17. Work in a group of two or three students. Find an easily available product (for example, a pen). Think of all the creative ways the product can be used. You need to prepare at least 10 alternative uses including unconventional methods for that particular product.

3-18. A Facebook group of more than 25,000 people is trying to convince Cadbury, the venerable British confectioner (now owned by Kraft Foods), to produce a giant chocolate Cadbury Crème Egg that contains a filling made from fondant that resembles the yolk and white of a real egg. (Currently, giant Cadbury chocolate eggs, which are about the size of an ostrich egg, are hollow, a great disappointment to fans of the company's smaller chocolate eggs that are filled with creamy white and yolk-colored fondant.) A Cadbury spokesman says that "creating a [chocolate] shell that is strong enough to contain the sheer weight of the fondant is technically challenging." Use the creativity-enhancing techniques described in this chapter to develop potential solutions that would allow Cadbury to manufacture a giant Crème Egg.

3-19. A major maker of breakfast cereals was about to introduce a new multigrain cereal. Its principal selling point is that it features "three great tastes" in every bowl: corn, rice, and wheat. Because a cereal's name is an integral part of its marketing campaign, the company hired a costly consulting firm to come up with the right name for the new product. The consulting firm tackled the job using "a combination of structural linguistics and personal creativity." One year and many dollars later, the consulting firm gave its recommendation. Take 20 minutes to list names that you think would be appropriate for this cereal. Make brief notes about why you think each name is appropriate. Your professor may choose to prepare a list of names from all the members of your class and may take a vote to determine the "winner."

3-20. Every quarter, Inventables, a creative design company in Chicago, sends its clients a package called a DesignAid that contains 20 items, each with "unexpected properties," as a way to stimulate innovation and ideas for new products or services. One Inventables' recent DesignAid package included the following items:

- Translucent concrete—concrete that contains thin layers of fiber optics, which create semi-transparent stripes in the concrete.
- Sound-recording paper—A piece of cardboard-like paper that records and plays sounds with the help of ultrathin electronics embedded in the page.
- Impact-absorbing silicon—Silicon that, despite being only one inch thick, absorbs impact, including microvibrations. If you drop an egg on it, the egg won't break.
- Wireless battery-free speakers—Solar-powered speakers receive sound via infrared waves rather than radio frequencies and are capable of producing directional sound. In other words, only the person at whom the speakers are aimed can hear the sound coming from them.

Select one of these items and work with a small group of your classmates to brainstorm as many alternative uses for the item as you can in 15 minutes. Remember to abide by the rules of brainstorming!

3-21. Each hemisphere of the brain processes information differently, and one hemisphere tends to dominate the other. Consider the following lists of words and decide which one best describes the way you make decisions and solve problems:

Metaphor	Logic
Dream	Reason
Humor	Precision
Ambiguity	Consistency
Play	Work
Approximate	Exact
Fantasy	Reality
Paradox	Direct
Diffused	Focused
Hunch	Analysis
General	Specific
Child	Adult

If you chose the list on the left, you tend to engage in "soft" thinking, which suggests a right-brain orientation. If you chose the list on the right, you tend to engage in "hard" thinking, which suggests a left-brain orientation. Creativity relies on both soft and hard thinking. Each plays an important role in the creative process but at different phases. Identify which type of thinking—soft or hard—would be most useful in each of the seven stages of the creative process.

3-22. List five things you can do to develop your thinking skills in the area (soft or hard) that least describes your decision-making style.

3-23. Interview at least two entrepreneurs about their experiences as business owners. Where did their business ideas originate?

3-24. How important are creativity and innovation to these entrepreneurs' success?

3-25. How do these entrepreneurs encourage an environment of creativity in their businesses?

Endnotes

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