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Think Inside the Box

Forget brainstorming: People are at their most innovative when they work within the constraints of what they already know..

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The most consequential ideas are often right under our noses.

When most CEOs hear the word "innovation," they roll their eyes. It conjures up images of employees wasting hours, even days, sitting in beanbag chairs, tossing Frisbees and regurgitating ideas they had already considered. "Brainstorming" has become a byword for tedium and frustration.

Over the past decade, we have asked senior executives, on every continent and in every major industry, two key questions about innovation. The first: "On a scale of one to 10, how important is innovation to the success of your firm?" The second: "On a scale of one to 10, how satisfied are you with the level of innovation in your firm?"

Not surprisingly, they rate the importance of innovation very high: usually a nine or 10. None disputes that innovation is the No. 1 source of growth. Without fail, however, most senior executives give a low rating—below five—to their level of satisfaction with innovation.

How could business leaders rate innovation as so important yet feel so dissatisfied with their own organizations' performance? Because what they really want to know is how: How do you actually generate novel ideas and do so consistently, on demand?

The traditional view of creativity is that it is unstructured and doesn't follow rules or patterns. Would-be innovators are told to "think outside the box," "start with a problem and then brainstorm ideas for a solution," "go wild making analogies to things that have nothing to do with your product or service."

We advocate a radically different approach: thinking inside the proverbial box, not outside of it. People are at their most creative when they focus on the internal aspects of a situation or problem—and when they constrain their options rather than broaden them. By defining and then closing the boundaries of a particular creative challenge, most of us can be more consistently creative—and certainly more productive than we are when playing word-association games in front of flip charts or talking about grand abstractions at a company retreat.

Our method works by taking a product, concept, situation, service or process and breaking it into components or attributes. Using one of five techniques, innovators can manipulate the components to create new-to-the-world ideas that can then be put to valuable use. The five techniques are:

# Subtraction

 Remove seemingly essential elements.

Consider a contact lens, an exercise bicycle, a package of powdered soup and an ATM. What do they have in common? They have all had something subtracted. Subtract the frame of a pair of glasses and you have the contact lens. Remove a bike's rear wheel and you invent the exercise bicycle. Extract water from soup to make a package of powdered soup. Take the bank employee out of a cash transaction and you have an ATM.

The original Sony 6758.TO -0.36% Walkman was a cassette recorder that had the recording function subtracted, which seemed to defy all logic: a spinoff product that did less than the original. Even Akio Morita, Sony's chairman and the inventor of the Walkman, was surprised by the market's enthusiastic response.

Philips Electronics used subtraction to revolutionize the DVD market. Remember when a DVD player looked like a traditional, bulky VCR player, with a confusing array of buttons and displays on the front panel? The Philips team hit on the idea of removing these functions from the DVD player itself and placing them on a hand-held device. The result: a slimmer, cheaper, sleeker and easier-to-use DVD machine—and a new design standard not just for DVD players but for the whole home-electronics market.

# Task unification

 Bring together unrelated tasks or functions.

Samsonite, 1910.HK +3.01% the world's largest travel-bag company, used task unification to expand into the college backpack market. Backpacks, especially for college students, cause back and neck strain due to the weight of their contents: textbooks, laptops, beverages and so on.

Instead of padding the straps like other backpacks, the Samsonite team created a way to use the heavy weight as a comfort advantage. The straps are shaped so that they press softly into the wearer's shoulders at strategically located shiatsu points to provide a soothing massage sensation. The heavier the contents, the deeper the sensation and the more stress relief for the wearer.

Or consider the Captcha system, which you have probably experienced many times but without knowing its name. Captcha (an acronym for Completely Automated Public Turing Test to Tell Computers and Humans Apart) is what asks you to type words written in a bizarre, distorted script inside a box before you're allowed to enter a website. Ticketmaster, for instance, uses Captcha to prevent the automated programs of scalpers from immediately scooping up the most desirable seats for events.

What most people don't realize is that their Captcha answers serve two purposes—and here we get to task unification. In addition to proving to websites that they are not machines, the users of Captcha are deciphering difficult-to-read words from printed texts. The system's inventor, a Carnegie Mellon computer scientist named Luis von Ahn, realized that by feeding into Captcha words that computer scanners can't read—especially the old fonts often found in older publications—users could help in the massive task of transforming printed content into digital form. Ordinary web surfers are helping to transcribe the equivalent of nearly 150,000 books a year.

# Multiplication

 Copy a component and then alter it.

In 1804, the British scientist William Hyde Wollaston invented the single-element concavo-convex meniscus lens, which has been used ever since in simple focus-free box cameras, including the famous Kodak EKDKQ -4.51% Brownie. Serious photographers need more versatility, however. So over the past century, camera makers have multiplied the basic lens and changed its shape to create an entire spectrum of lenses for different sorts of images: close up, far away, wide angle or even blurred or grossly distorted. Each works with one click of a button, but with dramatically different effects.

Or consider the razor. Since the Bronze Age, men have been shaving using a single blade. Then, in 1971, Gillette introduced the TRAC II Twin Blade Shaving System, which sported two blades instead of one. Twin blades give a closer shave because each blade performs a different function. The first blade pulls up the hair so that it is unable to retract into the skin before the second blade, set at a slightly different angle, cuts it off. The TRAC II set off a still-ongoing competitive frenzy of multiplication in the shaving industry.

A range of products are the obvious result of multiplication, from bifocal lenses and double-sided tape to three-way light bulbs. But multiplication works for services as well. For the College Board, which designs, administers and scores the SAT, maintaining the validity of its test is a big challenge: Colleges want an entrance exam that is consistent in what it measures from year to year. But how can the College Board gauge the difficulty of questions before students are actually scored on them?

The answer: by including "experimental" questions in order to assess them for inclusion in future tests. These particular questions are not scored, but students have no way of knowing that, so they spend about 25 minutes of the 225-minute testing period answering zero-value questions. By using multiplication in this way, the College Board is able to offer a "new" test each year while ensuring that its quality matches that of previous tests.

# Division

 Separate the components of a product or service and rearrange them.

Instances of this technique abound, from airline check-in procedures that now have you print your boarding pass at home to the TV remote control whose functions used to be attached to the box itself. Or consider central air-conditioning. The first air-conditioning units contained all the necessary components in a single box: thermostat, fan, cooling unit. But once the motor and fan of the cooling unit were separated from the other pieces, they could be placed somewhere else—like outside a house, thus reducing noise and heat and eliminating the need to block a window with a bulky integrated unit.

Johnson & Johnson JNJ 0.00% used the technique of division to completely redesign the medical-sales training program of one of its business units. It divided the course content—anatomy, surgical procedures and medical devices—into smaller chunks and then rearranged it around relevant diseases and conditions. This approach dramatically reduced the amount of time needed to train a sales representative and made it much easier to roll out training on new products to its existing sales force.

# Attribute dependency

 Make the attributes of a product change in response to changes in another attribute or in the surrounding environment.

An excellent example of this technique is eyewear with transition lenses, which change from light to dark in the sunlight. So, too, are windshield wipers that speed up as it rains harder.

Some instances of this technique have been around for so long that they no longer seem especially creative, but they once were. This is especially true with respect to pricing. Take, for example, loyalty programs that offer discounts to long-standing customers or discounts based on the number of friends that a customer recommends. Both work by making one variable dependent on another.

But different variables apply to different products. For iced tea, seasonality has long been the decisive factor: It's a product for cooling off in summer. Beverage Partners Worldwide, a joint venture between Nestlé NESN.VX 0.00% and Coca-Cola, KO -0.17% wanted its Nestea brand to compete more effectively against the market-leading Lipton, so it changed that seasonal calculus. The result was the Nestea Winter Collection, a line of "iced tea" products designed to be consumed at room temperature or even heated. The new product line reversed the typical slump in winter sales by responding to that colder environment and creating a brand-new market.

Using any one or all of these "inside the box" techniques involves retraining the way your brain thinks about problem solving. Most people think innovation starts with establishing a well-defined problem and then thinking of solutions. Our method is just the opposite: We take an abstract, conceptual solution and find a problem that it can solve.

This approach to innovation was first described in 1992 by the psychologist Ronald Finke. He discovered that people are actually better at searching for benefits for given configurations (starting with a solution) than at finding the best configuration for a given benefit (starting with the problem). Imagine a baby bottle and being told that it changes color as the temperature of the milk changes. Why would that be useful? Because it would help to make sure that you don't burn the baby with milk that is too hot. Now imagine you were asked the opposite question: How can we make sure not to burn a baby's mouth with milk that is too hot? How long would it take you to come up with a color-changing milk bottle? You might never arrive at the idea.

The key to being consistently innovative is to create a new form for something familiar and then to find a function it can perform. That is why, when we first hear about a new idea, we often experience a sense of disappointment with ourselves: Gee, why didn't I think of that? The most consequential ideas are often right under our noses, connected in some way to our current reality or view of the world.

Inventions can be extraordinary, but invention isn't an extraordinary event or an activity for a specialized group. Nor is creativity reserved for the gifted and talented. It's a skill that can be learned and mastered by anyone, if approached properly. Like so much else in life, the more it's practiced, the more skillful at it we become.

 Adapted from "Inside the Box: A Proven System of Creativity for Breakthrough Results," which has just been published by Simon & Schuster. Previously a Johnson & Johnson executive, Mr. Boyd is an assistant professor of marketing and innovation at the University of Cincinnati. Mr. Goldenberg is a professor of marketing at the School of Business Administration at the Hebrew University of Jerusalem.

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