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INSIDE THE BOX

The creative method that works for everyone
CONTENTS

Introduction 1

1. Creativity Hides Inside the Box 15
2. When Less Becomes More: The Subtraction Technique 38
3. Divide and Conquer: The Division Technique 70
4. Be Fruitful and Multiply: The Multiplication Technique 97
5. New Tricks for Old Dogs: The Task Unification Technique 129
6. Clever Correlations: The Attribute Dependency Technique 159
7. Contradiction: A Path to Creativity 189
8. Final Thoughts 221

Epilogue 227
Acknowledgments 231
Notes 237
Index 245
They cannot scare me with their empty spaces
Between stars—on stars where no human race is.
I have it in me so much nearer home
To scare myself with my own desert places.
—Robert Frost, “Desert Places”

The year 1968 is seared in world memory as phenomenal in Olympic achievements. In high-altitude, oxygen-poor Mexico City, Bob Beamon’s world-record long jump of 29 feet 2.5 inches was hailed as the greatest athletic achievement of all time. Beamon’s Olympic medal achievement exceeded the previous world record by 21¾ inches, and remained unsurpassed for twenty-three years.

Beamon’s remarkable challenge to gravity was not the only news coming out of the Mexico City Olympics. In a different corner of the stadium, an unknown athlete was responsible for one of the most dramatic and sensational triumphs in the history of sports. Dick Fosbury won the gold medal in the high jump with a back-first flip that he had invented, and which represented a radical innovation over previous jumping strategies. Although he did not set a world record, Fosbury’s achievement revolutionized the sport. In less than ten years, virtually all high jumpers had adopted his approach, rendering the previous high-jump technique obsolete. This newly embraced method was
named the “Fosbury Flop” after its charming and modest, almost shy, originator.

These two men are examples of outstanding yet radically different paths to success in their fields. Using a conventional technique, Beamon extended the limits of what was possible in his sport. His record is an example of excellence of execution by taking a more-of-the-same approach. In contrast, Fosbury invented a new technique that gave him an edge over more traditional high jumpers. Although superb performance is an important aspect of professional success in any field, in this book we focus on the second outcome, igniting creative revolutions.

Interestingly, the Fosbury Flop example is used often by conference speakers and is featured in training materials to support the idea that revolutions originate from outside-the-box thinking. After all, the technique was almost the polar opposite of the then-dominant “straddle,” in which the jumper approached the bar face-first, jumped, and rolled over the bar right side up, with his stomach toward the bar. In contrast, Fosbury approached the bar with his side, turning his back to it when rolling over. That he literally used the opposite technique was taken as clear evidence that Fosbury was thinking outside the box.

This is a great story, we admit, but the truth is even more captivating, as Jacob and his colleagues discovered in an email interview with Fosbury himself.

When first learning the high jump at ten years old, Fosbury learned an antiquated, energy-wasting technique called the “scissors” by imitating children at the local gym. A year later, Fosbury’s physical education teacher and coach taught all the children trying out for track to jump using the classic straddle, also called the “Western roll.” Fosbury, however, continued to use the scissors jump until he reached high school, mainly because he was not able to master the straddle. (See figure 1.1, illustrating all three high-jump techniques.)

By high school, however, the scissors technique was no longer accepted. In switching to the straddle, Fosbury effectively had to learn how to jump all over again. As a result, he fell far behind his competitors. Extremely frustrated, Fosbury asked his coach if he could revert to the old scissors style to improve his results and boost his confidence.
Although not enthusiastic, the coach was sympathetic to the young athlete’s frustrations and agreed to let him try. So in a fateful career decision, instead of working to improve his straddle skills, Fosbury reverted to the technique he felt comfortable with, even if it was less efficient.

Fosbury decided to try his old style in his next competition. Feeling awkward yet determined, he cleared his previous best jump at 5 feet 4 inches, but when he faced a new height, he understood that something in the technique had to be changed. The most common problem with the scissors is that the jumper knocks the bar off with his or her buttocks. To compensate, Fosbury tried lifting his hips higher, which forced him to simultaneously drop his shoulders when he jumped. He continued to raise his hips until he eventually cleared another six inches, which allowed him to place fourth in a competition, setting a new personal record. No one noticed what Fosbury was doing, because he was tweaking the old technique, one tiny step at a time. Each attempt was only marginally different from the previous one. When Fosbury slowly began overtaking the competition, however, coaches for opposing teams noticed that he was doing something different. Checking the rule book, they could find no evidence for anything illegal in his hybrid technique. Fosbury was simply applying incremental improvements to an existing one. At some point, he began clearing the bar with his back, arching his hips, and then unarching to kick his heels over.

In 2003 Jacob and his colleagues conducted interviews with some of the world’s leading sports experts. They rated the Fosbury Flop as the
single most significant revolution in the history of sports. The Fosbury Flop received an average rating of 5, while innovations such as synthetic track or running shoes lagged by two or more points (figure 1.2).

Creativity speakers tell this story as a way of demonstrating that Fosbury was thinking “outside of the straddle box.” But as you can judge from the actual facts, this is not true. Fosbury was, in fact, thinking “inside the scissors box.”

THE CLOSED WORLD
This book explains Systematic Inventive Thinking, our inside-the-box way of thinking about creativity and innovation. We’ll show how the Closed World principle that you read about in the introduction—the idea that highly creative solutions to problems are often hiding in plain sight within an existing product, service, or environment—fits with Systematic Inventive Thinking.

But before we take our first steps together, let’s make sure that you’re on board with our basic premise. After all, we’re challenging today’s single biggest myth about creativity: that it requires outside-the-box thinking. We want to convince you that the opposite is true. Creativity is rarely achieved by broadening your horizons. You’re much more likely to become distracted by distant stars in a faraway galaxy
and come up with concepts that are irrelevant to the here and now. More important, elevating your vision encourages abstract thinking—that is, thinking with no basis in the concrete. Such ideas tend to be clichéd rather than creative, as the test of truly innovative ideas comes when you implement them. As the (clichéd) saying goes, the devil is in the details.

As we discussed in the introduction, we advocate a radically different approach. We believe that you’ll be most creative when you focus on the internal aspects of a situation or problem—and when you constrain your options rather than broaden them. By defining and then closing the boundaries of a particular creative challenge and then looking only inside these boundaries, you can be more creative more consistently than by musing about the stratosphere or, worse, waiting for the muse to descend.

Let’s start by understanding the inside-the-box thinking of the Closed World.

THE NINE-DOT PUZZLE

Although studying creativity is considered a legitimate scientific discipline nowadays, it is still a very young one. In the early 1970s, a psychologist named J. P. Guilford was one of the first academic researchers who dared to conduct a study of creativity. One of Guilford’s most famous studies was the nine-dot puzzle, presented with its solution in figure 1.3. He challenged research subjects to connect all nine dots using just four straight lines without lifting their pencils from the page. Today many people are familiar with this puzzle and its solution. In the 1970s, however, very few were even aware of its existence, even though it had been around for almost a century.

If you’ve never seen this puzzle before, take a moment to try to solve it before continuing. Those of you who have tried solving this puzzle can confirm that your first attempts usually involve sketching lines inside the imaginary square. The correct solution, however, requires you to draw lines that extend beyond the area defined by the dots.

At the first stages, all the participants in Guilford’s original study
(even those who eventually solved the puzzle) censored their own thinking by limiting the possible solutions to those within the imaginary square. Even though they weren’t instructed to restrain themselves from considering such a solution, they were unable to “see” the white space beyond the square’s boundaries. Only 20 percent managed to break out of the illusory confinement and continue their lines in the white space surrounding the dots.

The symmetry, the beautiful simplicity of the solution, and the fact that 80 percent of the participants were effectively blinded by the boundaries of the square led Guilford and the readers of his books to leap to the sweeping conclusion that creativity requires you to go outside the box. The idea went viral (via 1970s-era media and word of mouth, of course). Overnight, it seemed that creativity gurus everywhere were teaching managers how to think outside the box.

Management consultants in the 1970s and 1980s even used this puzzle when making sales pitches to prospective clients. Because the solution is, in hindsight, deceptively simple, clients tended to admit they should have thought of it themselves. Because they hadn’t, they were obviously not as creative or smart as they had previously thought, and needed to call in creative experts. Or so their consultants would have them believe.
The nine-dot puzzle and the phrase “thinking outside the box” became metaphors for creativity and spread like wildfire in marketing, management, psychology, the creative arts, engineering, and personal improvement circles. There seemed to be no end to the insights that could be offered under the banner of thinking outside the box. Speakers, trainers, training program developers, organizational consultants, and university professors all had much to say about the vast benefits of outside-the-box thinking. It was an appealing and apparently convincing message.

Indeed, the concept enjoyed such strong popularity and intuitive appeal that no one bothered to check the facts. No one, that is, before two different research teams—Clarke Burnham with Kenneth Davis, and Joseph Alba with Robert Weisberg—ran another experiment using the same puzzle but a different research procedure.

Both teams followed the same protocol of dividing participants into two groups. The first group was given the same instructions as the participants in Guilford’s experiment. The second group was told that the solution required the lines to be drawn outside the imaginary box bordering the dot array. In other words, the “trick” was revealed in advance. Would you like to guess the percentage of the participants in the second group who solved the puzzle correctly? Most people assume that 60 percent to 90 percent of the group given the clue would solve the puzzle easily. In fact, only a meager 25 percent did.

What’s more, in statistical terms, this 5 percent improvement over the subjects of Guilford’s original study is insignificant. In other words, the difference could easily be due to what statisticians call sampling error.

Let’s look a little more closely at these surprising results. Solving this problem requires people to literally think outside the box. Yet participants’ performance was not improved even when they were given specific instructions to do so. That is, direct and explicit instructions to think outside the box did not help.

That this advice is useless when actually trying to solve a problem involving a real box should effectively have killed off the much more widely disseminated—and therefore, much more dangerous—metaphor
that out-of-the-box thinking spurs creativity. After all, with one simple yet brilliant experiment, researchers had proven that the conceptual link between thinking outside the box and creativity was a myth.

Of course, in real life you won’t find boxes. But you will find numerous situations where a creative breakthrough is staring you in the face. They are much more common than you probably think right now. Throughout this book, we will be providing you with lots of examples of famous innovations that can be traced directly to the techniques—even if the creators of those innovations weren’t aware of what they were doing at the time. To demonstrate how simple the techniques are, we’ll also present real cases where individuals who used this approach successfully innovated across a wide range of industries and business domains.

**USING THE CLOSED WORLD TO OPEN UP CREATIVE POSSIBILITIES**

The Closed World is based on the idea that you look inward rather than outward, and that this propels you toward the virgin territory of truly creative ideas—ideas that are both original and useful.

Although he first published this idea in 2000, Roni Horowitz started developing his Closed World principle several years earlier by collecting data on what he considered highly inventive solutions to engineering problems. Horowitz noticed that these ideas all satisfied two conditions. First, they contradicted some essential belief in the prevailing wisdom about the right way to do things. (You’ll learn more about this, which we call contradiction, in chapter 7.)

Second, all the solutions were contained in a relatively small space surrounding the problem. This is what Roni called the Closed World of the problem. He believed that it could be applied as a general guideline in teaching creativity.

After several years of working with Roni, and on the basis of our own recent research and field experience of our colleagues at SIT, we had enough evidence to prove that the Closed World principle is indeed relevant to creativity in all fields. Here are several examples that will help you get a better idea of what the Closed World entails and how you can use it to become more creative.
One night, around midnight, two young aeronautics engineers decided to end a long day at their workplace and head home. When they reached the parking lot, they discovered a flat tire on one of the cars. As it happened, the two engineers were close friends. They had studied for their bachelor of science degrees together, they were working at the same company, and they enjoyed solving problems together. Neither of them knew that this inconsequential incident was going to change the direction of their lives.

The two engineers should have had no trouble changing the tire on the car, which was a rental that had to be returned in the morning. But when one of them tried to loosen the lug nuts with his tire wrench, he discovered that the nuts were rusted tight. The two engineers tried everything to put more pressure on the wrench, including standing and jumping upon it, but the nuts would not budge. In 1990, neither had a cell phone to call for assistance. Yet they didn’t feel right about abandoning the car in an empty parking lot.

Realizing that they would not be able to unscrew the lug nuts by sheer force, the engineers sought a different solution. Lengthening the tire wrench would give them added leverage to loosen the lug nuts. Perhaps a piece of pipe could be used to extend the handle of the tire wrench to give the leverage they needed. Unfortunately, they couldn’t locate any pipe or tubing. They realized that the solution, if any were to be found, would have to come from whatever materials were immediately at hand.

Before we continue with this story, please jot down the first, simplest solution to this problem. But it can’t be any of the following, which students in our workshops suggest all the time:

- Call for help using a cell phone. (It’s 1990—cell phones don’t exist.)
- Inflate the tire temporarily using one of those foam sprays. (The two friends don’t have a can handy.)
- Find a piece of metal pipe and use it to extend the tire wrench. (There’s none to be found.)
Hitch a ride to the nearest service station. (Why not go this route? One, it’s too dangerous, and, two, because we said so: the goal here is to come up with a Closed World solution.)

These noncreative solutions have one thing in common: they are far removed from the core element of the problem, which is the flat tire. Visually, you can think of them as existing outside the car; they are completely external to the car body.

So let’s use the Closed World principle. Let’s, metaphorically speaking, look inside the box, which in this case means inside the car—and only inside the car—for a possible solution.

One possible solution would be to place the tire wrench handle under the wheel of the car and utilize the car’s engine to move the wheel and push down on the tire wrench to loosen the lug nut. But this would require plenty of practice. Probably less difficult to execute is the idea of taking a few drops of oil from under the hood to lubricate and loosen the nuts. (By the way, if ever you need oil in a case like this, remember to use the brake oil, which does not get hot and attacks the rust better.) Another way to use the car’s components would be to attempt to lengthen the tire wrench handle with the tailpipe. But this is one solution that we really don’t recommend. You would need a hacksaw to cut off a section. Plus typical tailpipes are far wider in diameter than a tire wrench handle. You have no way to fit them together. This is a terrible idea, but it is more original than the pipe outside the car. Perhaps we are moving in an interesting direction?

All these ideas also have something in common: they are all inside the car, that is, part of the car. What these few simple solutions show is the inverse relationship between the degree of creativity and the distance of the idea or material (or “resource”) from the Closed World of the problem (changing a flat tire). The further away the resource, the less creative the solution it generates. Indeed, our Closed World principle says that the further you go from the problem, the less creative you will be.

Roni Horowitz was one of the two engineers in the story, and the