



DREW BOYD AND
JACOB GOLDENBERG

INSIDE THE BOX

Why the best business solutions
are right in front of you

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CONTENTS

<i>Introduction</i>	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
<i>Epilogue</i>	227
<i>Acknowledgments</i>	231
<i>Notes</i>	237
<i>Index</i>	245

INTRODUCTION

“It worked!” I told Jacob Goldenberg, my friend and coauthor of this book. “They used the method, and used it well.” Although it was late for us to be on Skype given the seven-hour time difference between Cincinnati and Jerusalem, Jacob was eager to hear how my latest class had gone. Jacob and his colleagues in Israel, Roni Horowitz and Amnon Levav, had developed a new method of creativity and had been teaching it to corporate executives, engineers, marketing professionals, and other business leaders all over the world. Still, this latest class of mine was a true test of whether the method was fail-proof and reliable as we all believed.

Yes it was, I was happy to report. One of the students in particular had achieved the kind of creative breakthrough Jacob and I had hoped for—and which we’d seen happen time and time again with seasoned professionals. I had handed sixteen-year-old Ryan an ordinary flashlight and, after walking him through the required steps of the method, instructed him to invent something new. Ryan’s invention was a simple modification of the flashlight’s on-off switch. He created a switch that would also act as a dimmer, changing the brightness of the light as needed. This may not seem to be a particularly exciting idea to you, and it’s not the most revolutionary idea we’ll introduce in this book. But listen to the circumstances.

Ryan was part of a group of special-needs students at the Hughes Center High School in Cincinnati. These students had various cognitive and motor limitations, including autism and learning disorders. Ryan has Down syndrome. Despite his cognitive limitations, he was able to learn and successfully use the same method that you will learn here, a method in use by leading corporations and inventors around the world.

A METHOD TO INNOVATE

The traditional view of creativity is that it is unstructured and doesn't follow rules or patterns. That you need to think "outside the box" to be truly original and innovative. That you should start with a problem and then "brainstorm" ideas without restraint until you find a solution. That you should "go wild" making analogies to things that have nothing to do with your products, services, or processes. That straying as far afield as possible will help you come up with a breakthrough idea.

We believe just the opposite. We'll show you that more innovation—and better and quicker innovation—happens when you work *inside* your familiar world (yes, *inside* the box) using what we call templates. We don't make that claim lightly. Jacob, Roni, Amnon, and their advisors, professors David Mazursky and Sorin Solomon, developed this method of creativity inspired by the work of pioneering researcher Genrich Altshuller. Altshuller discovered that creative solutions have an underlying logic that can be defined and taught to others. His focus on patterns in engineering solutions stimulated Jacob and his partners to ask the same questions about patterns in highly innovative products and services.

By 1999, this team had studied hundreds of successful products to see what made them different from similar products. What they found will surprise you. You'd think that new and innovative products would be quite different from each other. In fact, inventive solutions share certain patterns, patterns that can be formed into templates. These templates regulate our thinking and channel the creative process in a way that makes us more—not less—creative.

We believe innovators from all corners of the world have used templates in their inventions for thousands of years, most of them without

realizing it. Those templates are now encoded like DNA into the products and services you see around you.

Surprisingly, the majority of new, inventive, and successful products result from only five templates: subtraction, division, multiplication, task unification, and attribute dependency. These templates form the basis of the innovation method called *Systematic Inventive Thinking* (SIT). In the twenty years since its inception, the method has been expanded to cover a wide range of innovation-related phenomena in a variety of contexts. By using Systematic Inventive Thinking, companies have produced breakthrough results in many types of situations and in every part of the world. In this book we focus on the basic techniques and principles that are at the method's core and that make it unique.

You may have been struck by the word *systematic* in Systematic Inventive Thinking. Most people are. We know it sounds counterintuitive, the notion that creativity can be systematic. Yet it can be. The method also happens to be very effective at making creativity accessible to anyone. And by using the method, you will be consciously harnessing templates mankind has used intuitively for ages to create new ideas.

Does it work? Royal Philips Electronics, a world-leading electronics firm, used the "Subtraction" technique to revolutionize the DVD market. Remember when DVD players looked like the traditional bulky VCR players, with a confusing number of buttons and displays on the front panel? The Philips team used our approach to develop a DVD player controlled by a handheld device. The result: a slimmer, cheaper, easier-looking, and easier-to-use DVD machine. Philips's solution redefined the DVD market and established a new design standard for today's DVD players and other home electronics. That was just one of 149 usable ideas Philips generated using SIT on that occasion.

Samsonite, the world's largest travel bag company, used the "Task Unification" technique 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, laptop, and so on. Instead of padding the straps like all others, 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 strategi-

cally located “shiatsu points” to provide a soothing massage sensation. The heavier the contents, the deeper the sensation and the more stress-relieving for the wearer.

Pearson Education, the world’s leading education company, used the “Multiplication” technique to create a new course designed specifically for students who failed pre-algebra or algebra and needed a different approach to studying these subjects. By the way, it’s just a coincidence that the multiplication technique was helpful with the math curriculum; that same technique also led Pearson to invent a new audio planning coach that helps teachers plan their lessons and to create a new web-based approach to customer service.

In this book, we’re going to teach you how to apply our inside-the-box approach to develop any type of product, service, or process. We’ll illustrate each technique with lots of examples, both from clients we’ve worked with and from the world at large.

Consider, for example, Bill Frisell, one of the leading jazz guitarists since the late 1980s. He is known for using an array of electronic effects (delay, distortion, reverb, octave shifters, and volume pedals, to name a few) to create unique sounds from his instrument. One of Frisell’s favorite techniques to devise new sounds is to imagine having only one of the guitar’s six strings available to him. He subtracts the others by restricting himself to playing on one string and forcing himself to make more creative music. Bill Frisell became more creative when he worked inside the box—that is, confined to a guitar but with some key elements subtracted.

In situation after situation, the same five templates keep showing up as keys to innovation. The more you learn about this approach, the more you will start to see the five techniques being applied to solve tough problems and create all sorts of breakthroughs.

The five techniques are:

SUBTRACTION. Innovative products and services often have had something removed, usually something that was previously thought to be essential to the product or service. Discount airlines subtracted the frills. Removing the ear covers from traditional headphones gave us “ear buds”

placed inside one's ear. Subtracting the polymer from permanent markers created the dry-erase marker. Defying all logic, Apple took out the *calling* feature of its popular iPhone to create the iTouch and has sold sixty million iTouches since.

DIVISION. Many creative products and services have had a component divided out of them and placed somewhere else in the usage situation, usually in a way that initially seemed unproductive or unworkable. Products in your home that use remote controls deliver more convenience thanks to the “Division” pattern. Exercise dumbbells allow you to regulate the right amount of weight to build muscle mass. Computer printers allow you to separate the ink cartridge for easy replacement.

MULTIPLICATION. With this technique, a component has been copied but changed in some way, usually in a way that initially seemed unnecessary or odd. For instance, children's bicycles have regular wheels plus two smaller “training wheels” attached to the rear wheel to keep the bicycle steady while the child learns how to ride. “Picture-in-picture” TVs were a big hit with consumers because they allowed people to watch one show while keeping track of what was happening on another channel, such as a major sporting event or news story.

TASK UNIFICATION. With some creative products and services, certain tasks have been brought together and unified within one component of the product or service—usually a component that was previously thought to be unrelated to that task. Odor-Eaters socks keep you warm *and* have the additional job of deodorizing. Facial moisturizers now have the additional task of providing sunscreen protection. Advertisers have used this technique for years, placing ads on moving objects such as taxis, metro buses, and even school buses.

ATTRIBUTE DEPENDENCY. In many innovative products and services, two or more attributes that previously seemed unrelated now correlate with one another. As one thing changes, something else changes. Today's au-

tomobiles use this pattern a lot: windshield wipers that change speed as the amount of rain changes, radio volume that adjusts according to the speed of the car, and headlights that dim automatically for oncoming cars, to name a few. Smartphones provide information about restaurants, locations of nearby friends, and shopping preferences depending on your current location. The information is *dependent* on geolocation. It is hard to imagine life without these innovations, all created with this common technique.

WHY TEMPLATES MATTER

But wait. Doesn't this go against everything you've learned about creativity? Could creativity be as simple as following templates?

In 1914 psychologist Wolfgang Köhler embarked on a series of studies about chimpanzees and their ability to solve problems. He documented the research in his book *The Mentality of Apes*. In one experiment, he took a newborn chimp and placed her in an isolated cage, before she saw or made contact with other chimps. He named her Nueva.

Three days later, researchers placed a small stick in the cage. Curious, Nueva picked up the stick, scraped the ground, and played with it briefly. She lost interest and dropped the stick.

Ten minutes later, a bowl of fruit was placed outside her cage, just out of Nueva's reach. She reached out between the bars of the cage as far as she could, but to no avail. She tried and tried, whimpering and uttering cries of despair. Finally, she gave up and threw herself on her back, frustrated and despondent.

Seven minutes later, Nueva suddenly stopped moaning. She sat up and looked at the stick. She then grabbed it and, extending her arm outside the cage, placed the end of the stick directly behind the bowl of fruit. She drew in the bowl just close enough to reach the fruit with her hand. Köhler described her behavior as "unwaveringly purposeful."

Köhler repeated the test an hour later. On the second trial, Nueva went through the same cycle as before—displaying eagerness to reach the fruit, frustration when she couldn't, and despair that caused her to give up temporarily—but took much less time to use the stick. On all

subsequent tests, she didn't get frustrated and didn't hesitate. She just waited eagerly with her little innovation in hand.

Three-day-old Nueva created a tool using a time-honored creativity template, one of many used by primates—including man—for thousands of years. That template: use objects close by to solve problems. Once she saw the value in this approach, Nueva began using it over and over again.

Patterns play a vital role in our everyday lives. We call them habits, and, as the saying goes, we are indeed creatures of them. Habits simplify our lives by triggering familiar thoughts and actions in response to familiar information and situations. This is the way our brains process the world: by organizing it into recognizable patterns. These habits or patterns get us through the day—getting up, showering, eating breakfast, going to work. Because of them, we don't have to spend as much effort the next time we encounter that same information or find ourselves in a similar situation.

Mostly, without even thinking about them, we apply patterns to our everyday conventions and routines. But certain patterns lead to unconventional and surprising outcomes. We especially remember those patterns that help us solve problems. Patterns that help us do something different are valuable. We don't want to forget those, so we identify them and “codify” them into repeatable patterns called templates. You could say that a template is a pattern consciously used over and over to achieve results that are as new and unconventional as those you obtained the first time you used it.

Even chimpanzees like baby Nueva can follow templates once they see the value. She used the stick to retrieve the fruit. Her template became “Use objects close by for new tasks.” In fact, apes are quite good at this particular template; as Nueva did intuitively, they constantly use objects in their environment for unconventional ends. For example, they place sticks inside anthills so that ants crawl onto the stick for easy eating. Dr. Köhler's research showed that apes not only find indirect, novel solutions but also overcome their habitual tendency to use direct approaches. They “repattern” their thinking. They generalize the pattern so that it becomes usable in a variety of scenarios.