

# THE TOYOTA KATA

## PRACTICE GUIDE

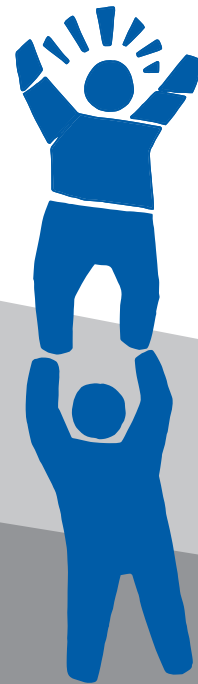
PRACTICING SCIENTIFIC  
THINKING SKILLS FOR  
SUPERIOR RESULTS IN  
**20 MINUTES A DAY**

**MIKE  
ROTHER**

ILLUSTRATIONS BY LIBBY WAGNER



NEW YORK CHICAGO SAN FRANCISCO ATHENS  
LONDON MADRID MEXICO CITY MILAN  
NEW DELHI SINGAPORE SYDNEY TORONTO



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## EXCERPT FROM *TOYOTA KATA*

There are perhaps only three things we can and need to know with certainty: where we are, where we want to be, and by what *means* we should maneuver the unclear territory between here and there. And the rest is supposed to be somewhat unclear, because we cannot see into the future! The way from where we are to where we want to be next is a gray zone full of unforeseeable obstacles, problems, and issues that we can only discover along the way. The best we can do is to know the approach, the means, we can utilize for dealing with the unclear path to a new desired condition, not what the content and steps of our actions—the solutions—will be.

—*Toyota Kata* (2009), page 8

## INTRODUCTION

# A WAY TO LEARN AND TEACH SCIENTIFIC THINKING

**K**ata are simple, structured routines that you practice deliberately, especially at the beginning, so their pattern becomes a habit and leaves you with new abilities. The word comes from the martial arts, where Kata are used to train combatants in basic building-block moves. But the idea of practicing Kata can be applied in a much broader sense. This practice guide is about practicing a scientific way of working, and, ultimately, thinking, in order to achieve superior results.

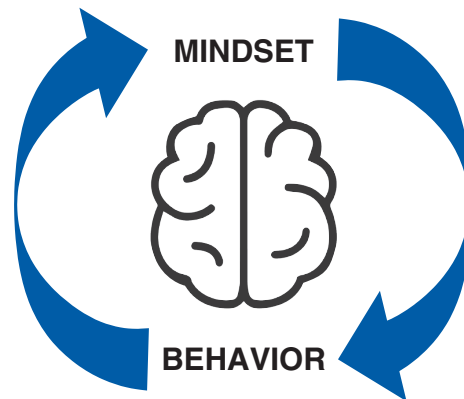
No one knows what the world will look like in the future, so one of the most valuable skills you can have is the ability to adapt. *Scientific thinking* is exactly that. It involves a running comparison between what you predict will happen next, seeing what actually happens, and adjusting based on what you learn from the difference. Scientific thinking may be the best way we have of navigating through unpredictable territory to achieve challenging goals. Practiced deliberately for even just 20 minutes a day, scientific thinking can make anyone more adaptive, creative, and successful in the face of uncertainty.

Perhaps the greatest thing about scientific thinking is that it is a life skill that's useful for developing solutions in any situation. We tend to equate creativity with the arts, but scientific thinking *is* creative thinking, and practicing it is at the root of creative capability and mindset. The purpose of this book is to share what we've learned about using the practice routines of the Improvement Kata and Coaching Kata to teach and learn scientific thinking.

You'll find that scientific thinking is not difficult, it's just not our default mode. Practicing the Improvement Kata and Coaching Kata forms habits that help you solve problems, achieve goals, and reframe how you look at and deal with the world. But it is not about learning problem solving. It's about learning a mindset that makes you *better* at problem solving.

**How do we modify our way of thinking, and how do you do that across a team or an entire organization?**

Many of our thinking patterns live in a self-perpetuating loop. Simply put, every time we think or do something, we are more likely to do it again (Figure I.1). Every time we think or do something, we're adding more pavement to the roadways in our brain, turning them into highways and increasing the likelihood that we'll use those same roads again. They're our habits.



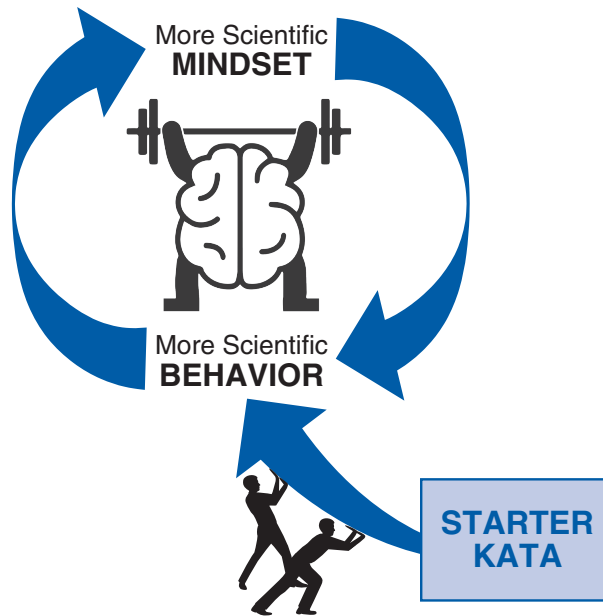
**Figure I.1.** Every time you think or do something, you are more likely to do it again.

The good news is that habits are essential to our survival. The even better news is that many of our thinking patterns can be modified, through a process that resembles skill development in sports and music. You deliberately practice a new behavior pattern, every day, and over time, and with the right set of emotions, that creates new neural pathways and reshapes your thinking.

However, shifting to a new, life-changing habit all at once is probably impossible, since the strength of our existing neural pathways, our existing habits, tends to pull us

back. It's usually more effective to start small, by introducing a few new routines into your daily activity and building on them as your abilities and confidence start to grow.

That's where Kata come in. Or, as I like to call them, "Starter Kata." These are structured practice routines that put you on the road to successfully developing new patterns of thinking (Figure I.2). Practicing Starter Kata modifies the mindsets that drive our behavior, increases the velocity of learning, and is particularly helpful when you want to create a shared way of thinking and acting in a group of people, because everyone starts with the same basics.



**Figure I.2.** Practicing Starter Kata helps you develop new thinking by introducing new behaviors.

*The Toyota Kata Practice Guide* is an instruction manual and reference book for a set of Starter Kata that are utilized to develop scientific thinking. It's designed for two users who work together as a pair:

- **The Learner:** Anyone who wants to become proficient, through practice, in the practical scientific working and thinking pattern described by the Improvement Kata.
- **The Coach:** Anyone who wants to become proficient at providing coaching support to the Improvement Kata learners by practicing the Coaching Kata.

*The Toyota Kata Practice Guide* gives you an approach for mobilizing the creative capacity of anyone and any team in any organization. Begin by practicing the Starter Kata presented in this book, and then, as you gain greater scientific thinking skill and understanding, build upon them to fit your situation and develop your own way. The Starter Kata are not the end game—they put you on the road to new skills.

## **A Way of Managing Suitable for Our Time**

We may be exiting a business period when the main challenges revolved around maximizing efficiency and reducing cost, and entering a time when challenges are more diverse and paths more unpredictable. Yesterday's solutions may not fit tomorrow's problems. But there is no cause for concern—we're well equipped to meet challenges of all sorts, as long as we practice an effective way of doing that. The most important thing for managers to focus on may not be the content of what their people are working on, but the patterns of thinking and acting we utilize as we strive for goals. What we are talking about here is developing the capability and confidence of people in the organization as a main aspect (and possibly *the* main aspect) of a manager's job.

The management methods we've been practicing over the last few decades were arguably intended to reduce uncertainty, but the management methods of the future may be as much about being effective and comfortable working within unavoidable uncertainty. Practicing the Improvement Kata and Coaching Kata is not going to make you and your team more certain about how to reach a particular goal. It makes you more certain about how to *go about reaching any goal*.

Although learning new skills involves a certain amount of discomfort, it's quite amazing what you can achieve through practicing a practical form of scientific thinking. The more scientific thinking capability you develop in your teams, the more you can empower them to meet challenges that you may have once considered impossible. Managers play a key role in this, because it is their job to create the creators. *The Toyota Kata Practice Guide* is a handbook for how to do that. Look around you. The workplace may be the largest classroom of all, and its managers are the teachers.

Mike Rother  
March 2017  
Ann Arbor, USA



## The Toyota Kata Backstory

The original Toyota Kata research my colleagues and I did ran from 2004 to 2009 and is summarized in the book *Toyota Kata*.<sup>1</sup> It was driven by these two questions:

1. What are the unseen managerial routines and thinking that lie behind Toyota's success with continuous improvement and adaption?
2. How can other companies develop similar routines and thinking in their organizations?

We knew something different was going on at Toyota, and we believed it lay in Toyota's management approach. But that system was not visible to visitors. My colleague, Professor Jeffrey Liker, put it well during a 2010 interview on the National Public Radio program *This American Life* about the Toyota-led NUMMI joint venture between Toyota and General Motors:

*There was no vocabulary, even, to explain it. So I remember, one of the GM managers was ordered, from a very senior level—it came from a vice president—to make a GM plant look like NUMMI. And he said, "I want you to go there with cameras and take a picture of every square inch. And whatever you take a picture of, I want it to look like that in our plant. There should be no excuse for why we're different than NUMMI, why our quality is lower, why our productivity isn't as high, because you're going to copy everything you see."*

*Immediately, this guy knew that was crazy. We can't copy employee motivation, we can't copy good relationships between the union and management. That's not something you can copy, and you can't even take a photograph of it.*<sup>2</sup>

We know from long experience in the Lean community that "copy the artifacts" approaches have a poor record for generating the kind of continuous improvement we see at Toyota. The Toyota Kata research was an attempt to better understand the *culture of improvement* that lay below the surface.

My colleagues and I began by interviewing Toyota people, but it quickly became apparent that they had difficulty articulating and explaining the patterns of their thinking and routines. I believe this is because such patterns represent the customary, habitual way of doing

*(continues)*

1 Rother, Mike, *Toyota Kata, Managing People for Improvement, Adaptiveness, and Superior Results*, 2009 McGraw-Hill.

2 Professor Jeffrey Liker, excerpt from Episode 403, "NUMMI," *This American Life*, aired March 26, 2010.

things in an organization, and are thus somewhat invisible to those carrying them out. This may be true for managers in any management system.

We had to figure it out ourselves by experimenting in factory and managerial settings. Five companies agreed to provide long-term test sites, and several additional companies became sites for shorter, specific trials. The experimenting involved applying technical and managerial Toyota practices and paying particular attention to what *did not* work as intended, investigating why, adjusting, and trying again. During that six-year investigation I also periodically met with Toyota-group sites, Toyota suppliers, and Toyota employees, to observe them and to discuss our interim findings. These discussions would often influence the character of our next trials.

Part of the research challenge was that each Toyota manager has his or her own style. Coaching at Toyota is not prestructured and is not necessarily daily. There is no formal coaching protocol and no protocol for daily practice, though that frequency is desired. Yet when you study what various Toyota managers do long enough, a common pattern of thinking and acting does emerge, which is taught at all levels inside Toyota. The content of what people work on naturally differs from area to area and level to level, as can each manager's approach, but the basic thinking pattern the managers are teaching is the same. After numerous tests and observations, we began to see a pattern of thinking and behavior in the way that Toyota managers work with their people, which is different from traditional Western command-and-control management routines.

We came to see that Toyota's management approach involves teaching all organization members a scientific approach and mindset that can be applied to an infinite number of challenges and objectives. Toyota wants its people to work scientifically, instead of jumping to conclusions. The teaching happens through coached application practice (currently called "on-the-job development" at Toyota) in the course of normal daily work, which creates a deliberate, shared way of working throughout the organization.

Seeing what's behind Toyota's management approach helps explain why simply reverse engineering the visible Lean techniques at Toyota doesn't work. Those practices happen to be solutions Toyota is using at this moment in time. What is more important is how Toyota develops its people to arrive at this moment and begin preparing for tomorrow. The learned scientific way of thinking and working is the invisible context within which Toyota's visible solutions are developed, function, and evolve. We would do well to adopt a similar way of working, rather than just trying to copy Toyota's tools and solutions.

Researchers usually try to represent the phenomenon they are studying with a model. I depicted the pattern of thinking and behavior that Toyota teaches with a four-step

behavior model that I called the “Improvement Kata.” I gave it this name because of the connection between Toyota’s management approach and the concept of Kata—meaning a *way of doing things* and *practice routines*—in Japanese culture.

### ***Focusing on Question 2***

We now had a model of what Toyota does. While this addressed the first research question, *What are the unseen managerial routines and thinking that lie behind Toyota’s success with continuous improvement and adaptation?* it did not address the second: *How can other companies develop similar routines and thinking in their organizations?* It didn’t take long to realize that just sharing the four-step Improvement Kata model, even in great detail, does not generate new ways of thinking and acting. As a result, since publication of the book *Toyota Kata* in 2009, we have focused almost exclusively on that second research question.

We had seen that at Toyota the choreography of the desired scientific thinking pattern lies inside the heads of Toyota’s seasoned coaches: its managers. Most other organizations do not have that. Toyota is working to *preserve* its culture and has many experienced coaches among its managers. Other organizations need to *modify* their culture and do not yet have managers with experience in coaching the scientific-thinking way. It’s another example of how you can’t just copy Toyota. Teams and organizations, even inside Toyota, will require coached practice to build those skills. And effective practice often starts with some simple routines.

Based on the details of what we observed Toyota managers doing, we have been evolving a set of practice routines—called “Starter Kata”—to systematize the practice that is handled implicitly inside Toyota’s culture. These Starter Kata make the process explicit, teachable, and transferable to compensate for the fact that most organizations do not yet have a strong surrounding organizational culture of scientific thinking.

The set of practice routines in this book has evolved through trials and daily use at hundreds of different organizations, growing into a popular, non-Toyota-specific approach. It’s no longer about copying Toyota, but about emulating the intention and developing our own way.

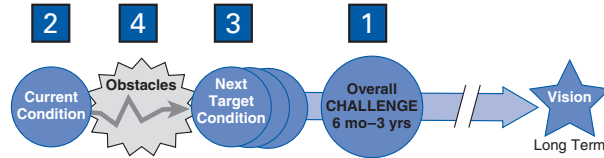
# THE IMPROVEMENT KATA

## A SCIENTIFIC PATTERN FOR EVERYONE

Let's face it—we have a natural tendency to jump to conclusions without realizing that our unconscious predispositions are influencing what we see, think, and do. You can make scientific, creative working a habit and get more comfortable with uncertainty by practicing the repeatable, four-step pattern called the *Improvement Kata*.



A **Kata** is a routine you practice to make its pattern a habit.



**START HERE 1**

Describe the overall challenge you're striving for, in a meaningful way.

What new situation do you want to have six months to three years from now?

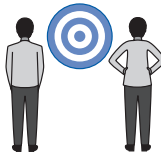
Future-state mapping is a useful tool here.

### USE THE OVERARCHING CHALLENGE AS A FRAME FOR THE FOLLOWING STEPS

**2 Current Condition:** Study the facts and data of where you are now. You're trying to see, sketch, measure, and understand the current pattern, as an input to Step 3.



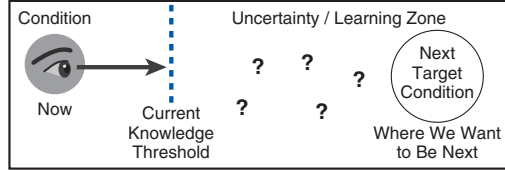
**3 Next Target Condition:** Now describe where you want to be *next* on the way to your challenge. It will usually take a series of target conditions to reach your challenge goal. Be sure the target condition is measurable in some way and has a specified achieve-by date between one week and three months out.



**4 Experiment Toward the Target Condition:** You can't foresee the exact path to the target condition. The obstacles you encounter show you what you *need* to work on to get there. Find the path by conducting experiments daily, using the *experimenting record* and asking the *five Coaching Kata questions* after each experiment.

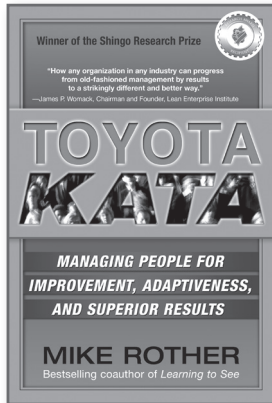


The point at which you have no facts and data is the *threshold of knowledge*. There's always a threshold of knowledge. To see further, conduct your next experiment there.

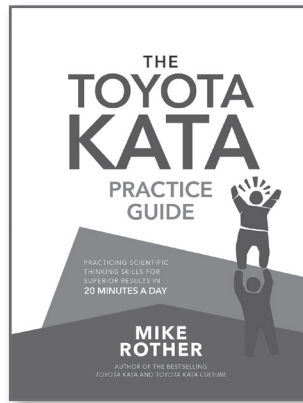




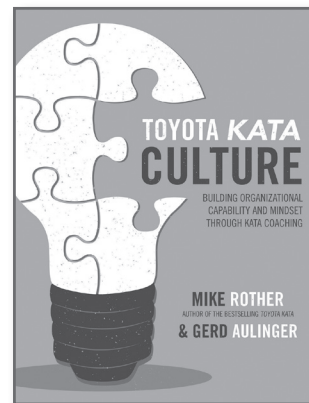
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