

THE TOYOTA WAY

2ND
EDITION

14 MANAGEMENT PRINCIPLES
FROM THE WORLD'S GREATEST MANUFACTURER

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Preface

The Wonderful Wacky World of Lean

We want organizations to be adaptive, flexible, self-renewing, resilient, learning, intelligent—attributes found only in living systems. The tension of our times is that we want our organizations to behave as living systems, but we only know how to treat them as machines.

—Margaret J. Wheatley, author of
Finding Our Way: Leadership for an Uncertain Time

THE PROBLEM: MISUNDERSTANDING OF LEAN AND “HOW IT APPLIES HERE”

Nobody can reasonably question the global impact of Toyota’s system of management and manufacturing on the world today. The Toyota Production System (TPS) is the framework for what is often called “lean” management and has been embraced in mining, retail, defense, healthcare, construction, government, finance, or name your sector. While we might assume that senior TPS experts, called “sensei,” or teachers, are delighted to see the system they are passionate about used in so many different industries, the reality is they are often disappointed and frustrated by how lean programs have turned a beautiful living system into a lifeless tool kit.

The problem is that so many have the view described by Margaret J. Wheatley in the opening quote and think that their organization is like a machine. Too many business executives are driven by the desire for certainty and control, and by the assumption that decisions made at the top of the organization will be carried out in a planned and orderly way. Anyone who has been on the shop floor guiding a “lean conversion” knows this is far from the truth. What happens is disorderly and surprising. A good consultant understands how to take positive advantage of unintended consequences for learning.

I have consulted to and taught leaders of companies all over the world who have the mistaken belief that lean transformation can be planned and controlled, just like updating your computer software (and even that may not go as planned). I consulted with a nuclear energy company whose vice president of continuous improvement believed his lean program was going gangbusters for the last three years. He proudly described a lengthy “lean assessment” that was tied to plant managers’ bonuses and his attempts to quickly deploy lean tools across the enterprise.

The VP was a bit concerned when his CEO requested Toyota’s help and Toyota loaned the organization one of its most senior TPS sensei, a student of the famed Taichii Ohno, father of the Toyota Production System. In Japan “sensei” suggests *honored* teacher, and it’s expected that students listen respectfully and follow the sensei’s lead. After the VP described the company’s lean program to the TPS master, he expected praise and congratulations. Instead, the sensei said, “Please stop doing that”—meaning stop doing assessments, stop value stream mapping all the processes, stop connecting implementation to bonuses, and stop trying to rapidly deploy the company’s version of lean across all manufacturing and service departments. Instead, the sensei said to start a “model line” example of TPS in a single department on a nuclear fuel production line and stop everything else. This would be a pilot led by the sensei to demonstrate TPS as a system and learn from it.

I spent two hours with the frustrated and confused vice president, who bemoaned: “Why did he want us to stop our good progress? Why did he want us to go slow like a snail when we have hundreds of thousands of people to train? How does he think he is going to get managers on board without any financial incentive?”

I tried to explain the thinking of the Japanese sensei. In a nutshell, I said, the Toyota Production System is a total “living system.” The goal is to produce a continual flow of value to the customer, without interruptions known as wastes. Toyota often uses the analogy of a free-flowing river, without stagnant pools and without big rocks or other obstacles slowing the flow. To accomplish this type of free flow in a business setting requires a system of people, equipment, and processes that operate at peak performance. And since the world is constantly changing, variability has to be addressed through continuous improvement by the people closest to the “genba” (or properly spelled “genba”),* which means where the work is performed.

I went on, “The Toyota master trainer looks at your operations and sees assorted tools of TPS mechanistically scattered around. But nowhere is lean oper-

* There is no *m* sound in Japanese, and “genba” is the correct English version, though “gemba” has become common usage. Jim Womack explains this and other similar terms well in <http://artoflean.com/index.php/2016/03/25/is-it-genba-or-gemba/>.

ating as an organic system of people using tools for continuous improvement. He wants you to see and experience real TPS and the results that are possible, at least once in one part of your company, before you start broadly trying to spread something nobody really understands. Trying to do it right one time in one area does not seem to him like a lot to ask.”

I could see the lightbulbs going on for the vice president as he listened and asked more questions. It seemed he was getting it. He lamented that the Toyota sensei had not explained TPS in this way before. He also explained that when he told the Toyota advisor that he was bringing me in to teach people about lean product development, the sensei responded that it would be a “waste of time.” I explained that the sensei was saying you are not ready to move beyond manufacturing since you had not a single example of a lean system. It is like asking beginning piano students to learn a Bach sonata before they can even put their fingers on the right keys and play a scale. As I was feeling proud of myself for enlightening this struggling soul, I saw the lightbulbs go dark again.

Finally, the VP confessed that he had not stopped anything—not the lean assessments tied to plant manager bonuses and not the rapid deployment of lean tools across the enterprise. In fact, he had brought me in to help “deploy” lean product development despite the sensei’s warning. He said the Toyota sensei did not understand that the nuclear energy company was very large and it was vital to spread lean as rapidly as possible. Such are my triumphs . . . and failures . . . as a consultant trying to persuade people. The sensei was right—even my best attempts to try to teach lean product development to this organization were a “waste of time.”

Lean, along with variations such as six sigma, theory of constraints, lean startup, lean six sigma, and agile development, is a global movement. As in any management movement, there are true believers, resisters, and those who get on the bandwagon but do not care a lot one way or the other. There is a plethora of service providers through universities, consulting firms of various sizes, not-for-profit organizations, and a book industry promoting the movement. For zealots like me, this is in a sense a good thing—they are building consumers of my message. But there is also a downside. As the message spreads and is passed through many people, companies, and cultures, it changes from the original, like the game of telephone in which the message whispered to the first person bears little resemblance to the message the tenth person hears.

Meanwhile, well-meaning organizations that want to solve their problems are searching for answers. What is lean and how does it relate to six sigma and agile? How do we get started? How do these tools that were developed in Toyota for making cars apply to our organization that has a completely different product or service? Can lean work in our culture, which is very different from Japanese culture? Can we upgrade lean methods using the latest digital technology? Do

the tools have to be used exactly as they are in Toyota, or can they be adapted to our circumstances? And how does Toyota reward people for using these tools to improve?

These are all reasonable questions, and there are lines of people ready to answer them, often in very different ways. But the starting point should be the questions themselves. Are these the right questions? As reasonable as they seem, I believe they are the wrong questions. The underlying assumption in each case is that lean is a mechanistic tool-based process to be implemented as you would install a hardware or software upgrade. Specifically, the assumptions can be summarized as:

1. There is one clear and simple approach to lean that is very different from alternative methodologies.
2. There is one clear and best way to get started.
3. Toyota is a simple organization that does one thing—builds cars—and uses a core set of the same tools in the same way everywhere.
4. The tools are the essence of lean and therefore must be adapted to specific types of processes.
5. There may be something peculiar about lean, as it was developed in Japan, that has to be modified to fit cultures outside Japan.
6. Toyota has a precise method of applying the tools in the same way everywhere that others need to copy.
7. The formal reward system is the reason why people in Toyota are engaged in continuous improvement and motivated to support the company.

In fact, none of these assumptions are true, and that is the problem—there is a huge gap between common views of lean and the reality of how Toyota evolved this powerful management system for over one century and how it can help your organization accomplish its goals.

My goal in this book is to give you a very clear understanding of what “lean,” or “lean six sigma,” or whatever you want to call it, really is: a philosophy and a system of interconnected processes and people who are working to continuously improve how they work and deliver value to customers. We will start by dismissing the common and simplistic notion that it is a program of using tools to remove waste from processes. If this is your organization’s view, you are doomed to mediocre results, and you likely will embrace the next management fad with similar mediocre results. I have seen this happen time and time again.

To help break through this cycle, I will demonstrate the real meaning of what Toyota discovered through discussions of the origin of the Toyota Way, the 14 principles I have distilled (summarized in the Appendix), and actual examples of organizations in manufacturing and services that have made progress on the challenging road to becoming a lean enterprise.

THE REAL TOYOTA PRODUCTION SYSTEM

Until recently, Toyota never used the term “lean” to refer to its production system. At first it had no name at all. It was simply the way the fledgling auto company learned to manufacture cars and trucks in the 1940s in order to deal with very real problems the company faced when first formed. The problems were clear—the company did not have money, it had limited factory space, and parts suppliers had to take a risk and invest in factories and equipment along with Toyota. Demand for automobiles in Japan after the devastation of World War II was low. The company struggled to get funding and had no choice but to eliminate waste. In response, it made low volumes of multiple models of vehicles on the same production line. It kept inventories low, because it lacked storage space and could not afford to tie up cash in parts or finished vehicles. And it kept lead times short both in the procurement and utilization of parts and in the production and sale of vehicles. All of this lowered production costs and enabled Toyota to get cash fast and, in turn, to pay suppliers (which were also struggling financially) quickly. (See a further discussion of Toyota’s history in “A Storied History: How Toyota Became the World’s Best Manufacturer” in the Introduction.)

A cornerstone of the Toyota Way is “challenge,” and there was no shortage of challenges. When Toyota was struggling to survive in its early years, with few resources and very low demand, Taiichi Ohno was asked to find a way to match Ford Motor Company’s productivity, which, owing to its size and economies of scale, was about nine times greater than that of Toyota. Faced with a seemingly impossible task, Ohno did what every Toyota leader has done before and after—go to the gemba, experiment, and learn. And like other great Toyota leaders he succeeded. He built on the core philosophies and methods of founders Sakichi Toyoda and his son Kiichiro Toyoda to develop the framework now called the Toyota Production System.

Ohno originally did not want TPS drawn as a picture, because he said TPS was something live on the shop floor, not something dead in a drawing. He said, “If we write it down, we kill it.” Nonetheless, it was eventually drawn as a house with two pillars and a foundation (see Figure P.1), a structure that is only as strong as all the parts working together.

The in-station quality pillar is attributed to Sakichi Toyoda, who invented the first fully automated loom for making cloth. One of his many inventions along the way was a device that automatically stopped the loom when a single thread broke, which called attention to the problem so humans could fix it as quickly as possible. He called this “jidoka,” a machine with human intelligence. These days it is often referred to as in-station quality—which means, don’t let a defect escape your station. The second pillar is just-in-time, attributed to Kiichiro Toyoda, who founded the automotive company. He declared Toyota would “remove slack

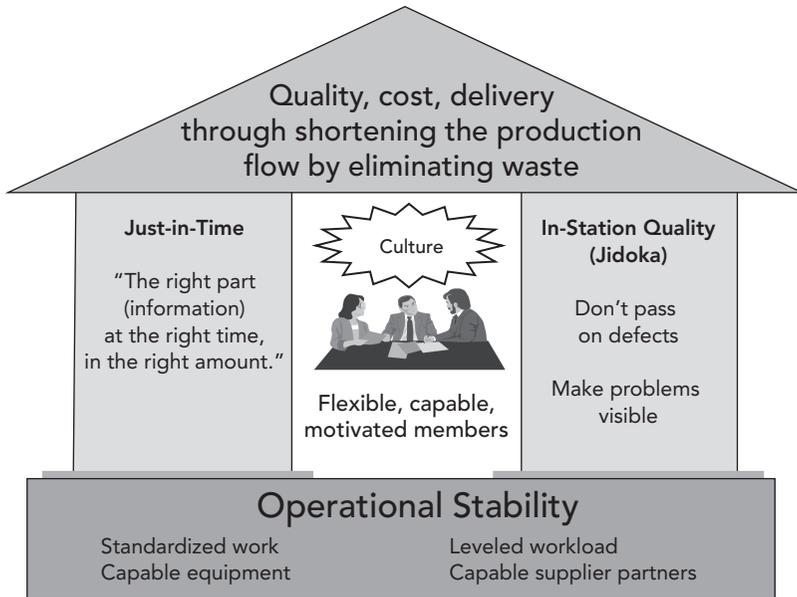


Figure P.1 The Toyota Production System.

from all work processes” and follow the principles of JIT—a move that was necessary at the time just to avoid bankruptcy. He designed detailed processes for doing this. The foundation of the house in the figure, or the company by extension, is operational stability, which means a level, stable workflow. A smooth and steady flow of work is necessary to have any chance of achieving just-in-time flow (Principles 2, 3, and 4) and fixing problems as they occur (Principle 6). And at the center of these processes are flexible, capable, motivated people who are devoted to continually improving (Principles 9, 10, and 11).

If we step back from the model, we see a brilliant logic. It is a living, organic system. The missing safety net—lots of inventory (or time or information buffers)—means problems show themselves very quickly and must be solved quickly. Built-in quality comes about as abnormalities are identified by every team member and addressed before they can bleed out to later processes or to the customer. As the problems are solved, the foundation of stability becomes stronger, allowing for less inventory, better flow, and a smaller number of problems, most of which can be effectively controlled as they occur.

At the center of surfacing and solving problems are developed people (Principle 12). They are the brains doing the problem solving. Take away their brains and motivation to improve, and what you have left is a system that hopelessly runs itself into the ground. Continuous improvement means getting better

every day and is the driver for building a sustainable enterprise. Only those at the gemba can understand the problems fast enough to react quickly. Continuous improvement depends on a different paradigm of the role of the human—all humans are problem detectors and problem correctors—thinking scientifically.

James Womack, Dan Jones, and Dan Roos called “lean production” the next paradigm beyond craft production and mass production in their classic 1991 book *The Machine That Changed the World*:¹

The lean producer . . . combines the advantages of craft and mass production, while avoiding the high cost of the former and the rigidity of the latter. . . . Lean production is “lean” because it uses less of everything compared with mass production—half the human effort in the factory, half the manufacturing space, half the investment in tools, half the engineering hours to develop a new product in half the time. Also, it requires keeping far less than half the needed inventory on site, results in many fewer defects, and produces a greater and ever-growing variety of products.

One of the greatest insights in this simple explanation is the idea of combining the “advantages of craft and mass production.” Lean production was not entirely new, and it did not toss away concepts from craft or mass production; rather, it built on the strengths of each, with a few twists. Even in today’s digital age Toyota reveres the craftsworker. I emphasize throughout this book how much Toyota places people at the center of its systems and expects that they spend a lifetime working to perfect their craft. “Use all your senses” is a common Toyota refrain to fully understand what you are working on and how to improve it.

THE TOYOTA PRODUCTION SYSTEM AS A MIX OF ORGANIC AND MECHANISTIC

In contrast to mechanistic organizations, “organic organizations are living systems, evolving, adapting, and innovating to keep pace with our complex, rapidly changing world.” According to BusinessDictionary.com, an organic organization is an:

organizational structure characterized by (1) Flatness: communications and interactions are horizontal, (2) Low specialization: knowledge resides wherever it is most useful, and (3) Decentralization: great deal of formal and informal participation in decision making. Organic organizations are comparatively more complex and harder to form, but are highly adaptable, flexible, and more suitable where external environment is rapidly changing and is unpredictable.