Toyota Kaizen Methods

Six Steps to Improvement

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Isao Kato and Art Smalley

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Foreword

After spending nearly 20 years at General Motors in various manufacturing positions, I was given the opportunity in the latter part of the 1980s to join Toyota Motor Manufacturing as the general manager of the Power Train Division in the United States. It was during my years at Toyota that I developed a close working relationship with Art Smalley and later Isao Kato.

During my Toyota years, Isao Kato was the principal training manager on various topics worldwide for Toyota Motor Corporation. He personally conducted significant training and development work for us in North America. Isao Kato was the trainer who taught me personally and also hundreds of other team members the basic concepts of standardized work, job instruction, Kaizen, and other topics. Most other Toyota trainers during the past several decades at one time or another have been developed by Isao Kato, and by extension his influence worldwide has been significant. Later, after his retirement from Toyota, Isao Kato helped Art Smalley and me by providing critical training on similar topics at Donnelly Corporation, where we led a successful lean transformation. These courses were critical to our success in both leadership development and implementation of the Donnelly production system.

The unique opportunity this book provides all of us is to take advantage of Isao Kato's nearly 40 years' experience of developing people inside Toyota on topics related to improvement. Art Smalley also has numerous years of experience working directly for Toyota in Japan, as a supplier to Toyota in the United States and as a consultant to Toyota, which is a rare combination of experiences. Their combined experiences help in presenting the various aspects of Kaizen in unique ways. Usually, we receive information from individuals who have merely read books, attended lectures, toured plants, or recited what they think happened. This book originates directly from two of the best Toyota had to offer.

What this book represents goes far beyond the current use of Kaizen as a simple week-long "event" or "blitz" type of activity. What I personally learned from people like Isao Kato and Art Smalley during my Toyota years was that a company's success largely can be attributed to total employee involvement in daily Kaizen. This difference is critical when compared to traditional Western manufacturing companies. Team members in Toyota working with improvement tools, involvement opportunities, and a structured process constantly delivered amazing results that surpassed my expectations.

The engine of the success for Toyota for decades has been how every team member is challenged to conduct waste observations every day, join a participation team to conduct mini ongoing Kaizen events, update the standard from Kaizen, and utilize the new improved method going forward. This book represents the six basic steps required to implement practical Kaizen activities in your organization. Once understood, these steps can be performed and applied throughout the entire company, with the entire team focused on Kaizen.

I recommend for most companies that the skills from this book should first be used to train and implement at the level of team leaders or first-line supervisory individuals. Engineers and managers will benefit as well. However, our training philosophy at Toyota was first to train the main two leadership levels with an expectation that the team leader and the supervisor would immediately begin coaching and implementing the Kaizen methods with their teams. The critical step here is to train and expect your leaders to become coaches and teachers leading their team members to success through the application of the six Kaizen steps. This process, once implemented, builds the knowledge and understanding of waste identification and waste elimination at all levels within the company as leaders are moved and promoted.

This book represents a model for understanding Kaizen inside Toyota and the skills required to analyze basic processes and drive improvement. This is the heart of the Toyota production system, and you can achieve the same degree of success if this Kaizen process is properly deployed within your company.

Russ Scaffede
Former vice president of manufacturing, Toyota Motor Manufacturing
Retired vice president of manufacturing, Toyoda Boshoku America

Chapter 1

Introduction

This workbook is about the topic of Kaizen and focuses on the skills, methods, and analysis techniques practiced inside Toyota Motor Corporation for the past few decades with regard to this topic. Please note that this is not a book about holding Western-style five-day Kaizen events, selecting areas for Kaizen, or detailing best practices for running such workshops. Five-day implementation workshops were in reality quite rare during the development of Toyota's production system and are virtually nonexistent today inside Toyota. In this workbook, we instead focus on the actual training course concepts and methods used by Toyota over the past few decades to *develop employee skill level* with regard to this critical topic. It is our belief that developing employee skill level in topics such as this one and others has always been a core element of Toyota's success.

We drafted the contents of this workbook with several specific goals in mind. One aim is to trace and communicate the main origins of Kaizen since the inception of Toyota Motor Corporation. Another main intent of this workbook is to articulate the basic six-step Kaizen improvement skills pattern that was taught inside Toyota. The steps are similar to other improvement programs in the past as well as problem solving and the scientific method. A third goal is to help practitioners of Kaizen improve their own skill level and confidence with this topic by simplifying it and removing as much of the mystery in the process as possible.

The internal Kaizen skills course at Toyota consisted of a combination of lecture, shop floor observation practice, and some implementation. The chief difference between it and the more common five-day workshop model practiced so widely outside Toyota is the amount of emphasis put on the skills development of the participant. In the Toyota Kaizen skills course, typical participants included first-line supervisors in manufacturing as well as young engineers. The dozen or so participants in the course were each required to learn a six-step pattern for Kaizen, master multiple analysis skills, implement a few simple improvement ideas during the week, and then, on returning to home locations, drive further

improvement in areas under their sphere of influence. The roots for all this are made clearer in Chapter 2 on the background of Kaizen in Toyota.

Mainly in this workbook we cover the classroom part of the Kaizen methods course, explaining each step in detail. For some steps of Kaizen (e.g., Chapter 5, "Step 2: Analyze Current Methods"), multiple techniques exist, and we outline those more commonly used. Most of the concepts can be depicted using explanation and simple diagrams. Some of the concepts best require demonstration, and we either attempt to explain the demonstration or provide instructional examples.

In each chapter on Kaizen, we also suggest homework assignments to be conducted independently for further learning. The part of the Kaizen basic skills course that we unfortunately cannot duplicate via workbook is the hands-on observation and implementation practice under the guidance of a skilled veteran. It is our hope in creating this workbook, however, that we can help many improve their own skill level and confidence in Kaizen.

The Kaizen skills concepts explained in this workbook should be of value to you whether you choose to use a five-day workshop model for implementation or some other vehicle for improvement. It is not our intent to prescribe the participation model by which you will drive implementation. Instead, we focus on the simple tools and skills that Toyota taught internally for decades to help individuals succeed in improving processes.

If you take the time to study the concepts detailed here, you will be reviewing the same methods and techniques that were drilled into generations of Toyota supervisors, managers, and engineers. These basic techniques are not the "magic bullet" or "secret ingredient" of lean manufacturing. However, mastery of these timeless techniques will improve your ability to conduct improvement in almost any setting and generate improvement results for your organization. We wish you the best of luck on your improvement journey.

Isao Kato and Art Smalley

Chapter 2

Background of Kaizen in Toyota

2.1 History of Kaizen Methods in Toyota

In this chapter, we briefly review the different influences on the concept of Kaizen inside Toyota and clarify some of its origins. As you will see, there is no simple or single beginning for Kaizen inside Toyota Motor Corporation. Kaizen is not a new word in Japanese, and the notion of improvement was always central to Toyota from the time of the founder Sakichi Toyoda and his son Kiichiro in their initial endeavors related to creating better looms in the early 1900s. In this background section, we briefly highlight some of the influences in Toyota's Kaizen methodology. For those interested just in the actual process and methodology, you can skip ahead directly to the chapters covering the six steps of Kaizen.

The word *Kaizen* in Japanese is written 改善 with two kanji characters meaning "to change" and "for the better." Unfortunately, the origins of the term are not exactly clear in terms of etymology. The word *Kaizen* is Chinese in origin and has roots as far back as the Qing dynastic period in China from 1644 to 1911. The term has always meant improvement, although it was not used exactly in the specific sense we use it today in lean manufacturing, business, or process improvement.

In the early part of the 20th century, the term *Kaizen* gradually started to appear in published Japanese works. However, it was not a word widely used by the general population. Kaizen was mainly used as a technical term in books and did not cross over into the modern spoken vernacular. Starting around the early 20th century, the industrial engineering movement in the United States and other countries made methods-based improvement a priority. Works by Fredrick Taylor Frank and Lillian Gilbreth and others in the field became popular topics. Translations of these books into Japanese no doubt spurred the need for a specific word to mean improvement in this sense, and adaptation of the Chinese characters representing "Kaizen" likely occurred.

Internally at Toyota, the term *rationalization* was often applied to early structural improvements in manufacturing. The term *Kaizen* started to proliferate inside the company in the 1950s and 1960s as an ongoing part of the Toyota Production System (TPS) development. Developing people who could analyze work methods and make improvements (i.e., creativity before capital) was a large priority. Out of such origins, the "Kaizen course" on which this workbook is modeled was born in the Education Department of Toyota and rolled out as training for many decades. Many versions of the Kaizen course exist, and it is not possible to depict all the versions used over the years. However, in a broad sense we can identify some of the main imprints on the development of the concept of Kaizen inside Toyota and the methods used to develop skill and ultimately improve process performance.

2.2 The Toyoda Precepts

Long before Toyota made automobiles, the company was known for making spinning and weaving machines known as looms. Sakichi Toyoda founded several different companies for this purpose and along with his son Kiichiro developed several highly successful automatic looms. These machines, with amazing and innovative design features, are still on display at Toyota's Commemorative Museum for Industry and Technology in Nagoya, Japan. Profits from the loom business and sale of technology are what enabled Toyota to venture into the automotive business in the mid-1930s.

Kiichiro and his adopted brother, Risaburo, codified the main principles[1] of their father as basic tenants of management for the company and named them the Toyoda Precepts. The five main tenants are expressed in Figure 2.1.

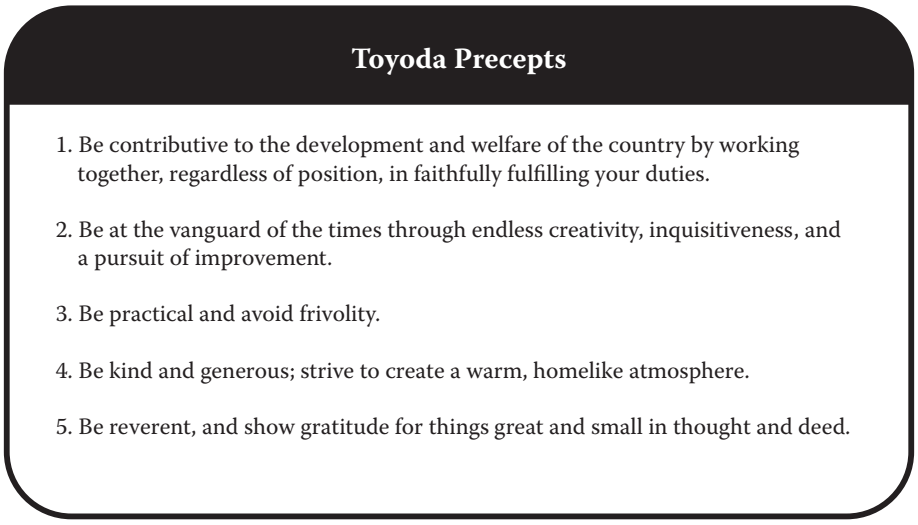

Figure 2.1 Toyoda Precepts.