

Welcome to the Wild West ... We call it lean

Toyota's internal production philosophy, the Toyota Production System (TPS), has been developed over nearly a century. Today, TPS is a well-known concept in the West and a role model for manufacturing and service organisations alike. TPS is even more fully established in Japan. Development in Japan has gone so far that virtually every bookshop in the country sells books such as *TPS for Dummies* and *Let's Study TPS in English*. Towards the end of the 1980s, there was a surge of interest in Toyota among Western researchers. They assigned the label 'lean' to their observations, thereby launching a new concept. Although the term 'lean' was created with Toyota as a starting point, lean and TPS are two different concepts. Although they have been developed and described in parallel, they are two different concepts.

Ohno defines the Toyota Production System

Taiichi Ohno started his career within the Toyoda family's group of companies in 1932 and is often referred to as 'the Father of TPS'. Through common sense and total dedication to the company over nearly sixty years, Ohno continuously developed Toyota's production philosophy. Together with Eiji Toyoda, cousin of Kiichiro Toyoda, the founder of Toyota, Ohno gave the philosophy the name 'Toyota Production System'. In 1978, Ohno published a book entitled *Toyota Production System: Beyond Large-Scale Production*. Ohno rejected economies of scale and large-scale production and maintained that productivity was created through flow:

'All we are doing is looking at the time-line from the moment the customer gives us an order to the point when we collect the cash. And we are reducing the time-line by reducing the non-value adding wastes.'

Initially, Ohno's book was published only in Japanese. It remains the most read book among Toyota's Japanese employees and is referred to as the company's bible. Although the book is aimed at manufacturing, Toyota's managers claim that everything that any leader needs to know about TPS can be read 'between the lines' of the book.

Ohno's book was first published in English in 1988. Prior to its publication, many Western authors had tried to explain TPS, but none had managed to do so in an easily accessible way.

Lean sees the light of day

The term 'lean production' first appeared in 1988, when it was used by John Krafcik in his article 'Triumph of the Lean

Production System', published in *Sloan Management Review*. The article compared productivity levels between different car manufacturers and identified two types of production systems: a robust system and a fragile system. Krafcik destroyed the myth that productivity was created through economies of scale and advanced technology (robust production systems) and proved instead that those factories (such as Toyota's) that had low inventory, low buffers, and simple technology (fragile production systems) were able to deliver high productivity and high quality. Krafcik thought that the term 'fragile' had negative connotations; instead, he used the term 'lean' to represent the efficient production system.

The book that changed the world

The ideas that Krafcik's article expressed were developed as part of the International Motor Vehicle Program, in which Krafcik participated. The research programme was housed at MIT in Cambridge, Massachusetts, and included leading researchers from all over the world. In 1990, based on this research, the international best-selling book *The Machine that Changed the World* was published. The authors, James P. Womack, Daniel T. Jones, and Daniel Roos, provided a comprehensive view of what lean production was about. The book was the result of many years of research and showed how Toyota successfully managed to achieve productivity and quality levels that none of its competitors could. The book argued that lean is made up of four core principles:

1. Teamwork
2. Communication
3. Efficient use of resources and elimination of waste
4. Continuous improvement

Womack and Jones have since continued to develop the lean concept and have published many articles and books. In 1996, their book *Lean Thinking* focused on what a company should do in order to 'be lean'. The book outlined five new principles with a clear focus on implementation:

1. Specify value from the standpoint of the end customer.
2. Identify the value stream and eliminate all steps that do not add value.
3. Make the remaining value-creating steps flow, so that the product flows smoothly towards the customer.
4. When the flow is established, let the customer pull value upstream from the next upstream activity.
5. When steps 1 through 4 are complete, the process starts all over again and continues until a state of perfection is reached in which perfect value is created with no waste.

By applying these principles, a company could start to 'leanify' its operations and improve the flow in its processes. *The Machine that Changed the World* and *Lean Thinking* have both been worldwide best-sellers and have made the greatest contributions to developing and spreading the lean concept.

Fujimoto places focus on Toyota's capabilities

Relatively few books about Toyota were published during the 1990s. A notable exception is Takahiro Fujimoto, who in 1999 released *The Evolution of a Manufacturing System at Toyota*, a book that attracted a lot of attention in Japan. Fujimoto gave a historical account of the evolution of Toyota's production system and managed to capture many abstract phenomena. Fujimoto argues that Toyota has developed three different levels of capabilities:

- Level one – routinised manufacturing capability
- Level two – routinised learning capability (Kaizen capability)
- Level three – evolutionary capability (capability-building capability)

In particular, Fujimoto argues that the key to Toyota's success is the capability of always ensuring development, regardless of what setbacks or obstacles the company encounters.

Decoding Toyota's DNA

At the same time as Fujimoto launched his book, researchers Steven Spear and H. Kent Bowen published an article in the *Harvard Business Review* entitled, 'Decoding the DNA of the Toyota Production System'. This article again brought TPS to the attention of the Western world. The article was based on a longer study of Toyota's production system in which the authors tried to decode the tacit knowledge absorbed within TPS. The results were presented as four rules for designing, operating, and improving processes and the activities in the processes:

1. All work shall be highly specified in terms of content, sequence, timing, and outcome.
2. Every customer-supplier connection must be direct, and there must be an unambiguous *yes* or *no* way to send requests and receive responses.
3. The pathway for every product and service must be simple and direct.
4. Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organisation.

This article has become one of the most frequently quoted articles on the topic. It is one of the few sources that manage to illustrate in a clear and simple way just how Toyota thinks about its organisational improvements.

The Toyota Way is encoded internally by Toyota

In 2001, Toyota released an internal publication called, *The Toyota Way*. This document, which outlined Toyota's core values, was translated into various languages and distributed throughout the Toyota Corporation to promote a consensus view within the multinational company. *The Toyota Way* comprises five basic values that are categorised within two key areas: *continuous improvement* and *respect for people*.

Continuous Improvement:

- Challenge – We form a long-term vision and meet challenges with courage and creativity to realise our dreams.
- *Kaizen* – We continuously improve our business operations, always striving for innovation and evolution.
- *Genchi Genbutsu* – We practice *genchi genbutsu*; we go to the source to find the facts to make correct decisions, build consensus, and achieve goals at our best speed.

Respect for people:

- Respect – We respect others, make every effort to understand each other, take responsibility, and do our best to build mutual trust.
- Teamwork – We stimulate personal and professional growth, share the opportunities of development, and maximise individual and team performance.

The Toyota Way is only sixteen pages long, and each value is illustrated with a testimonial from a Toyota employee. The publication has never been made officially available outside of Toyota and is still only used internally as a manual for Toyota's production philosophy. *The Toyota Way* represents the company's core values.

Liker launches The Toyota Way

In the early 2000s, books on Toyota and TPS were not high on the best-seller lists in Western countries. This changed when Toyota became the world's largest car manufacturer. Around

this time, in 2004, Jeffrey K. Liker published a book that he also entitled *The Toyota Way*. This book has become very popular, not only in the manufacturing industry, but also in the service industry. The book outlines Liker's own interpretation of Toyota's philosophy based on his many years of experience studying Toyota in the United States. He packages his version of *The Toyota Way* in the form of fourteen principles:

I. Long-term philosophy

1. Base your management decisions on a long-term philosophy, even at the expense of short-term financial goals.

II. The right process will produce the right results

2. Create a continuous process flow to bring problems to the surface.
3. Use 'pull' systems to avoid overproduction.
4. Level out the workload.
5. Stop the process if necessary to fix problems in order to get the quality right the first time.
6. Standardise tasks and processes for continuous improvement and for employee empowerment.
7. Use visual control so that no problems are hidden.
8. Use only reliable, thoroughly tested technology that serves your people and processes.

III. Develop your people and your partners

9. Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others.
10. Develop exceptional people and teams that follow the company's philosophy.
11. Respect your partners and suppliers by challenging them and helping them improve.

IV. Continuously solve root problems to drive organisational learning

12. Go and see with your own eyes in order to understand the situation thoroughly.
13. Make decisions slowly by consensus, and implement decisions rapidly.
14. Become a learning organisation through relentless reflection and continuous improvement.

Lean explosion!

Lean has continued to develop in parallel with the release of the books on TPS. Both academics and practitioners have developed lean into a concept in its own right that is separate from the writings on Toyota, even if it is still largely associated with the Japanese car giant.

Although lean originally developed within the manufacturing industry, the concept has been adapted to other functions, environments, and industries, including such functions as purchasing, product development, logistics, service, sales, and accounting. The concept has also been adapted to other industries, such as banking and insurance, retail, consulting, media and entertainment, healthcare, medicine, telecom, and IT.

The interest in Toyota and lean has led to hundreds of books and articles. A quick search on Amazon for business books released in 2014 with the word 'lean' in the title revealed over one hundred different titles. A summary of the usages of the term 'lean' in the subject matter of the books is found below:

Lean accounting	Lean IT	Lean revolution
Lean acres	Lean labour	Lean selling
Lean agile	Lean leadership	Lean service
Lean and green	Lean library	Lean six sigma
Lean banking	Lean manufacturing	Lean software
Lean business schools	Lean management	Lean start-up
Lean culture	Lean marketing	Lean supply chain
Lean design	Lean ministry	Lean sustainability
Lean doctors	Lean office	Lean system engineers
Lean education	Lean problem solving	Lean transformation
Lean enterprise	Lean product development	Lean thinking company
Lean healthcare	Lean publishing	Lean training games
Lean hospitals	Lean R&D	

A lean explosion just hit the world! Suddenly, it seems as though everything has become lean. Suddenly, this is lean, that is lean, and this is lean too! With so many books available, it is difficult to distinguish between what lean *is* and what lean *is not*. Some books deal with lean as an abstract concept, like an approach, a philosophy, a culture, or as principles. Other books treat lean as something more concrete: a way of working, a method, tools, and techniques. There is no single generally accepted definition of lean. This fragmentation presents a problem for practitioners and academics alike because this constantly developing concept refers to different things.

