WHY IS TOYOTA SO HARD TO COPY?

Stephen Denning

Why can't GM be more like Toyota? It's not for want of trying. GM even had a formal partnership with Toyota to produce cars together. Toyota shared everything it knew about making cars with GM, but GM still couldn't seem to get it. Now GM teeters on the brink of bankruptcy, propped up by Government funding, while Toyota has overtaken it as the world's largest car manufacturer.

To be sure, Toyota itself has problems in the downturn, but nothing on the scale of GM's, which stem from one brute fact: people prefer the cars of Toyota to those of GM. Why? Why didn't GM learn what Toyota does and then replicate that?

GM is of course not alone in finding it hard to figure out what makes Toyota great. The foremost foreign expert on Toyota, Jeff Liker, writes in *The Toyota Way*,: "What percent of companies outside of Toyota and their close knit group of suppliers get an A or even a B+ on lean [manufacturing]? I cannot say precisely but it is far less than 1%."

"Far less than 1%" is a fairly low number. And it's not that Toyota has been in any way secretive. On the contrary, it has been a model of openness, inviting visits from its competitors, and publishing extensively about what it does and how it does it. Why is it so difficult to learn? What is Toyota's secret sauce?

"WE CAN'T UNDERSTAND THE TOYOTA WAY"

One clue comes from a recent exchange, reported by Jeff Sutherland, the co-creator of the agile software development movement. Sutherland believes that in order to understand agile software development, you have to be able to understand what Toyota does and how it does it.[1] So he got a group of senior executives to read *The Toyota Way*. He received back word from the executives they couldn't understand *The Toyota Way*. These were people who had been to Harvard Business School, or its equivalent, and they still couldn't understand *The Toyota Way*!

So then he asked, "Well, what do they understand?" The reply he got was that they understood a book called *The Toyota Production System* (1978) by Taiichi Ohno. Ohno's book is a short book (short is good). Ohno's book is also a very clear book (clear is good), and packed with insights about what Toyota does and how it does it. So Sutherland said, "Fine! Let's have them study Ohno's book."

Now, Taiichi Ohno's book is in many ways a wonderful book. Who better to write it than the person who contributed most to the way

Toyota makes cars? The elimination of inventory, the pull system of production, the leveling of production flows—all these production innovations stem from work of Taiichi Ohno and all are described in his book.

Ohno was an engineer who developed his ideas and implemented in the period from around 1948 to 1960. At first, he imposed his ideas on his fellow employees, who often thought he was crazy. For about a decade, his approach was called the Ohno Production System, in case it didn't work. It was only around 1960, that it was apparent that it was working that it became known as the Toyota Production System. During this time of innovation, he had the support of the Toyota's chairman. In most companies, he would have been fired as a difficult, autocratic trouble-maker.

And autocratic he was. There are many stories about his authoritarian ways. One of them concerned a visit that he made to a Toyota warehouse, which the people were very proud of. He took one look at the warehouse and said, "Get rid of it! When I come back in one year's time, I want it to be gone!" And with that, he left. Within a year, the warehouse had been turned into a factory making cars.
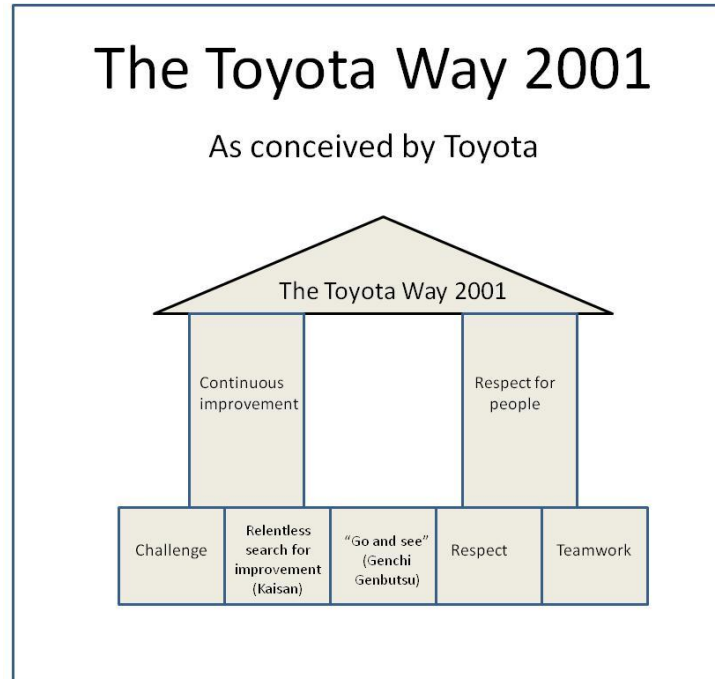
The Toyota Production System is in many ways a wonderful book, but there is one thing largely missing from it: teams. There are passing references to the existence of teams and the fact that work is done in teams, but there is nowhere in the book any explanation of the way that Toyota organizes and uses teams. The book is all about production processes, and the elimination of waste and unproductive work from those processes.

If you only read that book, you could easily conclude that the Toyota way is essentially about the elimination of waste from production processes. The reality is that nothing could be further from the truth.

TOYOTA ITSELF EXPLAINS THE TOYOTA WAY (2001)

As it happens, the Toyota management itself spent ten years in the 1990s working on a formulation of "The Toyota Way". What were the fundamental principles that made Toyota great? They spent ten years discussing and arguing about that. The result was a internal document entitled "The Toyota Way" and completed in 2001.

The conclusions are represented in the following diagram:

The Toyota Way 2001

As conceived by Toyota

The Toyota Way 2001

Continuous improvement			Respect for people	
Challenge	Relentless search for improvement (Kaisan)	"Go and see" (Genchi Genbutsu)	Respect	Teamwork

There are two main pillars of the Toyota way: "continuous improvement" and "respect for people". Each of the pillars rests on foundation stones. "Continuous improvement" rests "challenge", "relentless search for improvement (Kaisan)" and "go and see for yourself on the shopfloor (Genchi genbutsu)". "Respect for people" rests on "respect" and "teamwork".
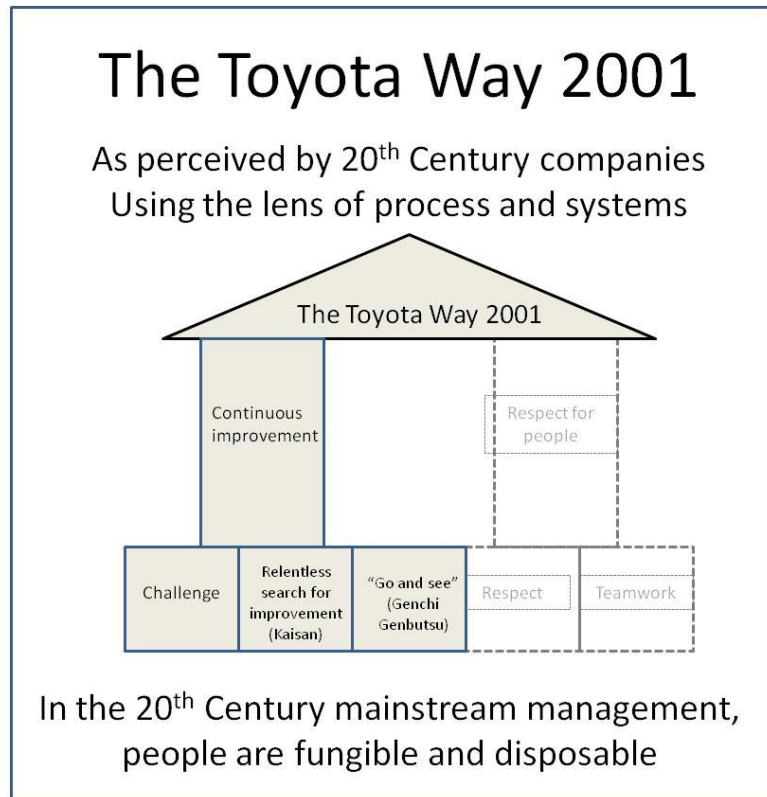
What's interesting about this picture is what is not there, as much as what is there. There is no sign for instance of the elimination of inventory, the pull system of production, the leveling of production flows—the key elements of Taiichi Ohno's book, *The Toyota Production System*. This is not to imply that those elements have been rejected. Rather the implication is that those elements are lower level details, mere consequences that flow from the more important principles of the Toyota way.

From this, we can begin to grasp why Sutherland's executives were able to understand *The Toyota Production System* (1978), but not *The Toyota Way* (2001). They were in sync with the process improvements developed by Ohno, and the pillar on the left, related to continuous improvement. They had much more difficulty seeing and understanding the pillar on the right involving respect for people and teamwork.

Coming from a culture and a management ethos where processes and systems are seen as more important than people, and where people are regarded as fungible and disposable elements of processes and

systems, these executives couldn't understand a company where respect for people and teamwork are central to everything Toyota does. What would it be like to work in such a company? They found it hard to conceive.

The executives' perception of the Toyota way was something like this:

The Toyota Way 2001

As perceived by 20th Century companies
Using the lens of process and systems

The Toyota Way 2001

Continuous improvement

Respect for people

Challenge | Relentless search for improvement (Kaisan) | "Go and see" (Genchi Genbutsu) | Respect | Teamwork

In the 20th Century mainstream management, people are fungible and disposable

Not surprisingly, the actual implementation of the Toyota production system ends up very differently from what happens in Japan. The Big Three automakers in the US (GM, Ford and Chrysler) have all tried to implement aspect of the Toyota production system. Significantly, **only a third of the Big Three plants use teams**. In other words, two-thirds of the plants are missing one of the two principal pillars of the Toyota Way 2001.[2]

Moreover those plants that did use teams end up with teams that are very different from their counterparts in Japan. A study of teams in Japan and in the Big Three automakers looked at 1-5 Likert-type ratings and got the following results:[3]

Team influence	Japan	US transplants
Who should do what job:	4.3	3.1
The way work is done:	4.3	2.9
Performance evaluations	3.2	1.3
Settling grievances:	4.2	1.6
Selection of team leader:	1.3	3.4

Although the teams in the US have more influence on selecting a team leader, on the crucial aspects of how the work gets done and how problems are resolved, the Japanese teams have much more influence than their US counterparts.

Trying to implement the Toyota way without self-organizing teams is likely to lead to the following result:
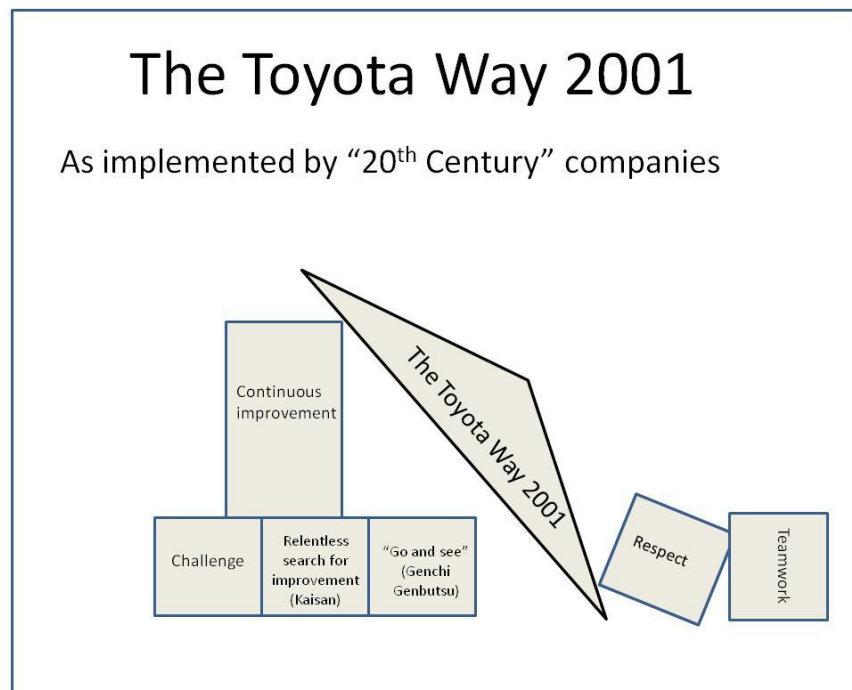
THE ROLE OF TEAMS IN AGILE SOFTWARE DEVELOPMENT

What is remarkable about the work of Sutherland and his colleagues in the methods that they have used to generate high-performance in software development is the emphasis that is put on importance of people over processes and systems, and the importance of self-organizing teams as a way of life.

The values are epitomized in the Agile Manifesto of 2001:

> *We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:*
>
> > **Individuals and interactions** *over processes and tools*
> > **Working software** *over comprehensive documentation*
> > **Customer collaboration** *over contract negotiation*
> > **Responding to change** *over following a plan*
>
> *That is, while there is value in the items on the right, we value the items on the left more.* [4]

Self-organizing teams are the foundation of the agile approach to software development. It is the team that is responsible for figuring out what work is involved in getting things done, how to do the work and taking responsibility for meeting deadlines and solving problems. The manager is seen as a coach who provides help to the team (but doesn't direct the team) and whose principal function is the removal of impediments that are preventing the team from getting on with the job.[5]

The values implicit in this approach are the direct antithesis of 20th Century management:

> > **Processes & systems,** over individuals and interactions
> > **Comprehensive documentation,** over results,
> > **Contract negotiation** over customer collaboration
> > **Following a plan** over responding to change
>
> *That is, while there was perceived value in the items on the right, the 20th Century valued the items on the left more.*

So it is no wonder that the Sutherland's executives cannot understand the Toyota Way. Nor is it really a surprise the efforts of US companies to emulate Toyota have been largely unsuccessful.

In software development, even with Sutherland's explicit emphasis on self-organizing teams, it is estimated that of the companies attempting to implement agile software development, only one-third are fully successful.[6] That's because the values and preoccupations of the 20th Century are still dominant in those companies.

The self-organizing teams promoted by Sutherland and his colleagues are very different from the conventional notion of a team. Many people get their idea of a team from watching NFL football, in which a set of coaches make all decisions about strategy and tactics. They decide who should play, how they should play, and what move should be made at any particular time. Self-organizing teams are much closer to basketball, in which the coach can help the team get ready for the

game, but once the game is under way, the flow of the game is in the players' hands.

Delegating a substantial amount of control to the team itself can be an disorienting experience for a manager steeped in the assumptions of 20th Century management. One critic wrote:

> *". . . the apparent faith in this odd vision of an idealistic human-oriented internetworked new world/new economy marches forward. I imagine all these folks holding hands in a large circle, rolling back and forth, with some in the middle of the circle, spinning and chanting and hugging, all naked.[7]*

What critics like this fail to note is that the successful self-organizing teams have a high degree of discipline built around them. There is for instance in the teams at Toyota a huge emphasis on transparency, and ways of visually representing performance so that progress or lack thereof is immediately obvious to everyone.

Similarly in the successful software development teams promoted by Sutherland and his colleagues, stringent measurement of the team's velocity and its progress towards its goals is fundamental. The discipline of daily meetings to assess progress and solve problems provides much more timely and reliable information about the status of work than the more conventional approach of following a static plan, which easily and frequently leads to disconnects with the reality of what is happening to execute the plan—disconnects that may take too long to become apparent for anything to be done about them.

Faith in the primacy of structure, systems and processes is still everywhere apparent. An ad for Harvard Business School in the Wall Street Journal today (February 4, 2009) states:

> *"In Driving Corporate Performance at Harvard Business School you will explore the connection between a company's strategy, its economics, and its control systems, learning to design, implement, and manage systems that help create value."[8]*

It is not that Toyota and the agile software developers don't believe in processes and systems. They do. The point is that they value people and high-performance teams more. They don't believe that a business based principally on structure, systems and processes will be efficient and agile enough to cope with today's quicksilver marketplace.

In any event, it doesn't matter what people believe: change is inevitable. Just as Toyota is markedly more able to meet customer needs than GM, and so disrupt its business, so the self-organizing teams of agile software development are showing themselves to be two- to four-times more productive than conventional methods of developing software. These are not marginal improvements. These are scale changes that will inevitably change the industry. Firms pursuing

software development using the traditional methods will simply not be able to compete.

What is needed for companies still embodying a 20th Century philosophy to change? The answer is summed up neatly by the French novelist Marcel Proust:

> *The real voyage of discovery is not about seeking*
> *new landscapes. It's about having new eyes.*

The executives in the US automakers and software developers attempting to implement agile principles will need to develop new eyes before they can understand the Toyota way. To operate with agility in the quicksilver world of the 21st Century, they will have to unlearn the values and preoccupations of the 20th Century and take on board the values and preoccupations that enable a firm to respect the individuals who work for them and create and sustain high-performance teams.

The change will happen whether they want it to or not. The only question is whether it will happen smoothly and elegantly and intelligently, or brutally and disruptively, as market forces crush outmoded ways of operating.

Washington DC
February 4, 2009

---

[1] www.**youtube**.com/watch?v=Ht2xcIJrAXo

[2] Liker, J.K., Fruin, W.M. and Adler, P.S.: *Remade in American: Transplanting and Transforming Japanese Management Systems*. 1999, Oxford University Press, NY. P.47.

[3] Ibid.

[4] http://agilemanifesto.org/principles.html

http://agilemanifesto.org/

http://en.wikipedia.org/wiki/Agile_Manifesto

[5] http://en.wikipedia.org/wiki/Scrum_(development)

[6] www.**youtube**.com/watch?v=Ht2xcIJrAXo

[7] John C. Dvorak in PC Magazine: February 22, 2002, http://www.pcmag.com/article2/0,1759,43161,00.asp

[8] http://ad.doubleclick.net/clk;208783902;11024269;d?http://www.exed.hbs.edu/programs/dcp/