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# SPEED TO MARKET

A Newsletter for  
Job Shops–Niche Manufacturers–Focused Distribution Systems  
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## Toyota Is Not Lean

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With all the ballyhoo and hype about the Toyota Production System (TPS) and the mad rush to export this system to every company under the sun, it may come as a surprise to learn that Toyota is not lean.

**Background:** There are a number of interpretations about who and what influenced the development of the Toyota Production System, but Taiichi Ohno, is generally considered to be the father of TPS, with able assistance from his right hand man, Shigeo Shingo. The basic idea is to orchestrate production so that components come to an assembly line just-in-time. This reduces inventory which is considered waste or *muda* in lean manufacturing terms.

Reducing inventory and eliminating other forms of waste requires a host of manufacturing tools and techniques which are now in the arsenals of an army of consultants who have infiltrated the industrial infrastructure, and are riding the current popularity of lean manufacturing. Lean is now an industry with its own insider Japanese words and concepts to separate the purists from the great unwashed. For example, the lean vocabulary includes such things as kan-ban or pull systems, 5S (for cleaning up and organizing a shop), cellular manufacturing, poke-a-yoke (mistake proofing), takt time, SMED (single minute exchange of dies), andon boards, visual control systems, seven wastes, kaizen (continuous improvement), value stream mapping, jidoka (worker control of the line), heijunka (level loading), kaikaku (see below), and more.

### Lean Principles

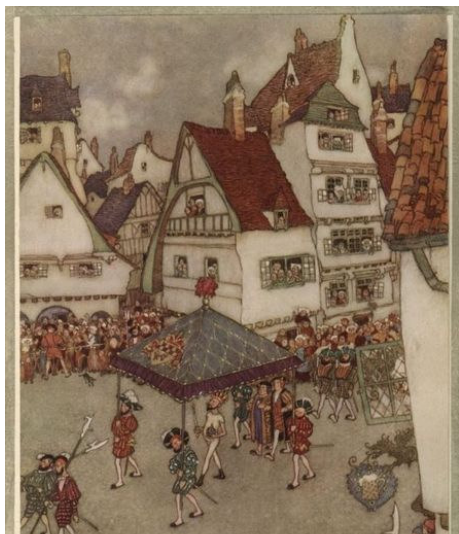
- 1) Precisely specify value by specific product
- 2) Identify the value stream for each product
- 3) Make value flow without interruptions
- 4) Let the customer pull value from the producer
- 5) Pursue perfection

From *Lean Thinking*, James P. Womack & Daniel T. Jones

But one thing Taiichi Ohno failed to visualize was how customers could pull value, one of the pillars of lean manufacturing. Without this, TPS is just another push system no different from any other auto company that builds cars to a forecast, and then shoves them on dealers' lots where the pressure is on to sell them. In lean terms, these unsold cars are waste. Muda...and plenty of it. In

fact, over \$10,000,000,000 (that's *billion*) in finished goods inventories according to Toyota's latest financials.

## The Emperor's New Clothes



*The Emperor's New Clothes*  
Illustration by Edmund Dulac

Many years ago, there lived an emperor who was quite an average fairy tale ruler, with one exception: he cared much about his clothes. One day he heard from two swindlers named Guido and Luigi Farabutto that they could make the finest suit of clothes from the most beautiful cloth. This cloth, they said, also had the special capability that it was invisible to anyone who was either stupid or not fit for his position.

Being a bit nervous about whether he himself would be able to see the cloth, the emperor first sent two of his trusted men to see it. Of course, neither would admit that they could not see the cloth and so praised it. All the townspeople had also heard of the cloth and were

interested to learn how stupid their neighbors were.

The emperor then allowed himself to be dressed in the clothes for a procession through town, never admitting that he was too unfit and stupid to see what he was wearing. He was afraid that the other people would think that he was stupid.

Of course, all the townspeople wildly praised the magnificent clothes of the emperor, afraid to admit that they could not see them, until a small child said:

"But he has nothing on!"

This was whispered from person to person until everyone in the crowd was shouting that the emperor had nothing on. The emperor heard it and felt that they were correct, but held his head high and finished the procession.

*From Wikipedia, the free encyclopedia*

**What will it take for Toyota to become lean?** The first thing Toyota (or any car company) must do is adopt a pull system and start building cars like Michael Dell builds computers. This model, called *mass customization*, combines the best features of mass production efficiencies with the build-to-order capability of...you guessed it...a job shop!

This is not as big a step as you might imagine. Mazak, which builds machine tools, has already transformed its business system from a build-to-stock to a make-to-order model. Now every machine they make has a customer's name on it, and is built to that customer's exact requirements. Salespeople no longer have to push machines that are already prebuilt; rather they work closely with customers to specify a machine that will fit the customer's needs precisely. And by the way, it takes less time and money to do it this way than it did to sell and modify machines that were already built.

Also, recognize the auto industry is fully capable of handling variations. Every car coming down the line now is different, so this is not a problem. They just have to connect cars to individual buyers, do it electronically, and handle the day-to-day demand fluctuations.

**Note:** Taiichi Ohno made the same mistake many modern-day industrial engineers and lean consultants stumble over. That is, they look at production in the context of the business rather than look at the business in the context of its environment. They do not recognize the difference between a production system and a business system, nor do they understand how manufacturing connects to corporate strategy. This is what they are missing—they are working at the wrong level of abstraction for designing a business system, and don't know the difference.

**Converting the Dealer System:** The second thing auto companies must do to become lean is convert dealers from mini warehouses into sales and service centers. The role of the dealer in a lean system would be to work with customers to specify the car they want, and then order it. This is sometimes called *consultative selling*. Dealers would have a few models customers could examine and test drive, but would not have vast inventories of new cars sitting on their lots depreciating by the minute. These centers might have advanced software and simulation capabilities that would enable a customer to create a full-size 3-D representation of the car he or she is interested in buying. Delivery would be just-in-time to meet customers' expectations. We are already starting to see this capability on the internet where car companies invite you to build your own car. It's pretty amateurish at this point, but could easily become a lot more sophisticated in a hurry. Dealers would also provide service and repair expertise, deal with warranty claims, and provide a resale center for used cars.

**Note:** Recognize that customers pay for the higher costs incurred in holding inventory in the price of their car. This is a violation of two more of the five lean principles: 1) precisely specify value by specific product; and 2) make value flow without interruptions. Inventory aging on a dealer's lot greatly interrupts the flow, and certainly does not add any specific value from the customer's point of view. In fact, it's just the opposite as customers have to pay for the cost of carrying inventory and receive no value for this cost. So far, the Toyota Production System violates three out of the five lean principles. And unless they are pursuing perfection to correct these major deficiencies, they might only be batting 20%.

**Will Toyota or any auto company ever become truly lean?** It would seem inevitable. As competition in the auto industry continues to escalate and new producers enter the field (China's budget Chery brand for example), car companies will be forced to find new ways to cut costs and compete more effectively. What could be better than having a car sold before it's built? The question is, who is going to do it first?

**Special Conditions in Michigan:** Everyone knows the big three automakers are having a tough time of it, and are continually losing market share to what are now called "the new domestics" (e.g., Toyota, Nissan, Honda, et. al.) It would not be surprising to see Michigan become a right to work state where union membership is optional, not mandatory. This would go a long way towards eliminating antiquated work rules and monopolistic labor prices. It might even encourage some of the new domestics to move north. Stay tuned for the next gubernatorial election where it may very well be a major issue.

**Kaikaku:** Kaikaku is a lean concept that translates as *radical change, transformation, or revolution*, and refers to a paradigm-breaking mind shift that enables one to achieve a higher level of understanding. This, in turn, can lead to a radical change in one's business model with dramatic improvement. Auto executives will have to experience kaikaku in order to break out of the 100 year old system they use for making cars that Henry Ford pioneered at the turn of the last century. Wickham Skinner, emeritus professor at Harvard University and author of the book,

*Manufacturing in the Corporate Strategy*, assesses progress made in industrial management over the last 100 years as “three yards and a cloud of dust.”<sup>ii</sup>

**A Comparison of Dell and Toyota:** This table illustrates inventory levels as a percentage of sales. Note that Toyota’s sales are 3.7 times Dell’s, but Toyota’s inventory is 26.7 times as much.

	Dell	% Sales	Toyota	% Sales
Net Sales	\$ 55,908		\$205,475	
Total Inventories	\$ 576	1.03%	\$ 15,352	7.47%
Raw Materials	\$ 329	0.59%	\$ 3,086	1.50%
Work in Progress	\$ 78	0.14%	\$ 2,015	0.98%
Finished Goods	\$ 169	0.30%	\$ 10,250	4.99%

In millions

**Summary:** With all the hype and mad rush to export the Toyota Production System to every company under the sun, it may come as a surprise to learn that TPS is not lean, and violates at least three, and maybe four, of five lean principles:

- Customers do not pull value; it’s a push system no different from the one Henry Ford pioneered over 100 years ago
- The flow of value to the consumer is interrupted at the dealerships, often for lengthy periods.
- Customers pay for the cost of carrying inventory which has no value for them, and adds to the cost of a car.

It’s a clear case of the emperor having no clothes. Toyota and other auto companies can become lean when they start to build cars with a business system that enables customers to pull value. However, in order to achieve this revolutionary (for the auto industry) transformation, auto executives will have to experience kaikaku. They will also have to learn to manage a mass customization model that operates very much like a job shop.

It’s equally important to reconceptualize the dealer system. The dealers’ role shifts from mini warehouses to sales and service centers that link customers to the production system, as well as provide repairs, service, and a source for used vehicles.

The job shop, long ignored in management education and academic literature, is emerging as the new industrial model. An understanding of the complex nature of job shop dynamics, and the development of management skill sets for these types of order-driven businesses, are essential for preparing industrial leaders for the future...and you thought you were just running a little shop.

<sup>i</sup> James P. Womack and Daniel T. Jones, *Lean Thinking*, Simon & Shuster, New York: 1996.

<sup>ii</sup> Skinner, Wickham, *Three Yards and a Cloud of Dust: Industrial Management at Century End*, *Production and Operations Management*, Volume 5, Number 1, Spring 1996