

# **Role of Management in a Lean Manufacturing Environment**

**Gary Convis, President, Toyota Motor Manufacturing Kentucky**

Since this column is meant to link automotive engineers with lean manufacturing, I would like to share my personal experience as a mechanical engineer who started out in the traditional way of manufacturing, and along the way discovered a much better way - the Toyota Production System.

I will describe what it was like to transplant this philosophy to American soil, in hopes that anyone attempting to change the culture of an existing plant towards "lean manufacturing" can benefit from my experience and observations. In particular, I intend to focus on the role of management in a TPS (or any lean manufacturing) environment.

In 1964, I took my hot-off-the-press BSME diploma and went to work for GM in their management training program. Later I joined Ford and worked my way up through Quality, Engineering, Maintenance and Manufacturing Management. During this 18-year stint I became acutely aware that our industry was in trouble. We were stuck in doing things the same old way, and that way was not getting the job done. We couldn't respond to the changing market. Worst of all, the people working in our plants couldn't make things better, even though they had plenty of good ideas, because they were bogged down by the rigid, traditional structures.

So I was ready for something new, and I found it - or rather, it found me, when Toyota recruited me to help start up NUMMI -- Toyota's joint venture with GM. For Toyota, it was a cautious first step; they were not at all sure that Americans could learn how to apply the Toyota Production System. But I was convinced that American workers were just as good as workers anywhere, or at least they could be, if they were allowed to perform up to their potential.

That was in 1984. I was part of the NUMMI team for 15 years, and it was a great experience. TPS proved to be highly successful at NUMMI, in spite of the fact that Toyota took it into a plant that had been closed two years earlier, and hired back most of the same people who had worked there before. Toyota's way of managing and manufacturing enabled us to make a total turnaround of that plant. Encouraged by NUMMI's success, Toyota built a plant in Kentucky, where I am now President.

In my opinion, the key to the successful implementation of TPS at NUMMI, and TMMK, and at the other Toyota plants in North America, has been the total commitment on the part of everyone to make it work. By that I mean, all levels of the organization, from team members to the senior managers, have to be aware of the fundamentals of TPS and have to make their best efforts

to practice and improve them day-by-day. This is much easier said than done, and I'll come back to this point later.

One of the fundamental elements of TPS that management must be fully committed to is the "customer-first" philosophy. Typically, organizations envision the customer only in terms of the person who purchases the final product at the end of the process. TPS has a different view.

Essentially, each succeeding process or workstation or department is the customer. In a Toyota plant, we work very hard to ensure that all team members and all departments realize their dual role: they are at once the customers of the previous operation and the suppliers to the next operation downstream.

For this concept to flourish, there must be no artificial barriers walling off one area from another or one department from another. Rather, the entire organization shares problems and must work together to ensure that a solution is found. Therefore, it is critical for the successful implementation of TPS that all managers support this idea and aggressively seek to solve problems, even if they are not directly within their scope of control. This all-hands-on-deck attitude is essential in a TPS environment.

The Toyota Production system is an integrated and interdependent system involving many elements. I like to think of it as a triangle, where one side is philosophy, one side is technology, and the other side is management. Cradled in the middle of the triangle is what TPS is really all about - people. Human development is at the very core of TPS. It is often overlooked, as people seize on the more tangible aspects of TPS. Engineers are particularly likely to latch on to tools like kanban, heijunka, and jidoka, and think they have captured the essence of TPS.

Of course the tools are important. TPS uses the technical elements, such as kanban, just-in-time, small lot delivery, Jidoka or quality in the process, heijunka or leveling of demand, visual control and 5S or clean, orderly worksites, to manage the day-to-day production system as efficiently as possible.

But the basic tenet of TPS is that people are the most important asset, and, for that reason, management must have a shop-floor focus. Toyota managers are taught that all value-added activities start on the shop floor; therefore the job of managers is to support the team members. Production team members appreciate management on the shop floor only when they can see that we are out there to help them do their jobs, not as part of a command structure, bent on telling them what to do.

In my experience, the most common roadblock to the successful implementation of TPS is the failure on the part of management - and particularly senior level leaders - to understand TPS as a comprehensive

approach to manufacturing and management. Too often, company leaders lack the total commitment to, and understanding of, TPS, that are essential to its adoption, and are unwilling to be involved in its day-to-day implementation and application. TPS is not simply a set of concepts, techniques and methods, which can be implemented by command and control. Rather, it is a fully integrated management and manufacturing philosophy and approach which must be practiced throughout the organization from top to bottom and consistently applied and kaizened day in and day out.

Another common reason TPS implementations fail is that managers try to implement individual elements instead of the entire TPS approach. Since the elements of TPS are integrated and interdependent, any attempt to implement TPS only partially is bound to produce very unsatisfactory results.

For TPS to work effectively, it needs to be adopted in its entirety, not piecemeal. Each element of TPS will only fully blossom if grown in an environment that contains and nourishes the philosophies and managerial practices needed to support it. I liken this to a greenhouse, where just the right combination of soil, light, temperature, humidity, water and nutrients allow plants to grow and flourish. If any one of these elements is removed, the plants will weaken and eventually die.

TPS is an interlocking set of three underlying elements: the philosophical underpinnings, the managerial culture and the technical tools. The philosophical underpinnings include a joint shop-floor, customer-first focus, an emphasis on people first, a commitment to continuous improvement or kaizen, and a belief that harmony with the environment is of critical importance. The managerial culture for TPS is rooted in several factors, including developing and sustaining a sense of trust, a commitment to involving those affected by first, teamwork, equal and fair treatment for all, and finally, fact-based decision making and long-term thinking.

All of these facets of TPS - the philosophical mindset, the managerial culture and the technical tools - must be in place and in practice for TPS to truly flourish and provide the high-quality, high-productivity results it is capable of producing.

What have I learned from my experience with the Toyota Production System, that I can pass along to you? First, I have learned that the human dimension is the single most important element for success. Management has no more critical role than motivating and engaging large numbers of people to work together toward a common goal. Defining and explaining what that goal is, sharing a path to achieving it, motivating people to take the journey with you, and assisting them by removing obstacles - these are management's reason for being.

I'll never forget the wise advice given me by a man I grew to respect and admire very deeply, Mr. Kan Higashi, who was our second president at

NUMMI. When he promoted me to vice president, he said my greatest challenge would be "to lead the organization as if I had no power." In other words, shape the organization not through the power of will or dictate, but rather through example, through coaching and through understanding and helping others to achieve their goals. This, I truly believe, is the role of management in a healthy, thriving, work environment.

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## **Senior Management: Key to Lean Success**

**By Russ Richardson, Partner, Witness Inspection, Inc.**

It would be hard to find a complaint about nine-plus years of solid economic growth. But for those who care about continuous improvement and the imperative to become Lean in the manufacturing environment, the economic boom of the 1990s was no friend.

A booming economy can be a wonderful thing if you're interested in a promotion. And if the economy is booming enough, it might even provide you with the opportunity to get a promotion you haven't quite earned.

Over the past decade, the manufacturing sector saw an awful lot of that. Orders were flowing in so quickly, and manufacturers were growing so dramatically, that it became essential to put bodies into positions as quickly as they could be found. Skill and experience were welcome, but such commodities were hard to find. And when the orders just keep flowing in, regardless of your quality performance, why worry about it?

Find someone who will take the job. Give them the job. Keep filling the orders.

A good economy beats a bad one any day, but if good economies have drawbacks, one is certainly the opportunity they provide for mediocre-performing companies to nevertheless earn healthy profit margins, all while feeling no sense of urgency to improve operations or eliminate waste.

In that respect, our recent economic boom was no friend of the industry-wide imperative to embrace the principles of Lean manufacturing.

Lean is about better quality, lower cost and faster delivery. You achieve it by rooting waste out of your system at every turn. And as those who take this seriously are starting to realize, you cannot become truly Lean by treating it

like a special program. It requires a fundamental, philosophical and cultural change of how your organization does business. It requires senior management and front-line leaders to insist - while leading by example - that Lean principles permeate every activity, every decision and every movement.

In most organizations - especially those who have not focused on this before - that is a major change that requires a huge undertaking to achieve. How many huge organizations seek to implement major changes when all indications are that everything is just fine? And if you define "just fine" as healthy profit margins, an awful lot of manufacturers spent the past decade doing very fine indeed.

But if you define it by an interest in continuous improvement, the current state of manufacturing is another story entirely. Some of my knowledge comes from my own business, and what my marketing efforts allow me to see. My company manufactures automation equipment that sorts parts without requiring hand sorting. It eliminates human error and saves time and money.

When marketing this technology, few question that it will work. What many do question, however, is whether they "need" this improvement when they are able to run an error rate of 50 parts per million - or more - and still make a profit. It speaks to a mindset. Some manufacturers recognize that they are never so good that they don't need improvement. Others figure that as long as the profits are rolling in, there's no need to change anything.

Until, of course, the economy slows, and newly fickle customers start demanding improvements at every turn.

Welcome to 2001 and the vaunted economic slowdown. With much of the manufacturing world suddenly hurting, those at the top of the food chain are making it clear that only those companies who can perform at a certain level are going to have a piece of the pie. Specifically, manufacturers are being expected like never before to provide high quality, low cost and fast delivery.

In other words, they have to become Lean.

This brings us back to those free-flowing promotions, endemic to the recently paused booming economy.

Many manufacturers who, for a decade, have enjoyed boom times with little attention to operational excellence are in serious trouble because the people they promoted into senior management have not the slightest clue how to even identify waste, let alone eliminate it.

Waste in the manufacturing setting, of course, takes many forms. It can take the form of wasted movement, wasted time, wasted scrap, wasted transportation and many other forms. Sometimes it takes the form of

overproduction. Ultimately, it is about the throughput of the system, and eliminating the waste inherent therein.

There is no shortage of targets, but it takes a trained eye to spot them. And too many people in manufacturing management positions today did not bring such a trained eye to the job.

Some who find themselves in this position, to their credit, are willing to reach out and seek help. Lean consultants have more than enough to do these days. But overwhelmed senior managers who bring in consultants to help them sort out Lean need to understand that the consultants cannot *do* Lean. They can only help identify issues and steps. Lean is only real when it represents that cultural sea change within the company, and senior management *must* be the leader there.

The key is to have a committed core team that understands the business environment, and can strategically attack issues - focusing wisely on two or three at a time, the much talked about high leverage points, rather than 20 or 30.

Consultants can help, but senior management has to do it. That can be a pretty complicated task when you're 10 years behind the curve and your management team still needs to learn how to recognize waste. So it might be a good time to get started.

\* Witness Inspection, Inc., based in Holland, Michigan, allows its customers to achieve an error rate of zero parts per million thought the use of its ZPPM technology. ZPPM technology applies vision automation to industrial sorting, eliminating human error, reduction costs and speeding delivery.