Lean Processes and Employee Involvement: Transforming West Michigan Manufacturing

G.W. Haworth learned two valuable business lessons from trash bins and parking lots.

As he looked in trash bins throughout the plants of the office furniture manufacturing company he founded, Haworth could think of only one thing: eliminating waste. "I was always looking for some explanation about why this piece of trash was in here," he said.

And as he looked over the parking lot, he was reminded of the company’s backbone: people. "I would think, ‘We need to make payments on all those cars this week,’” he said. Haworth believed in “getting the right person at the right job and giving them the opportunity to express what they think about the job and how they can make it better.”

Haworth’s lessons are at the heart of two principles that, although they are not new, are transforming the way business is done in West Michigan – lean manufacturing and participative management.

- Lean manufacturing is an overall methodology that seeks to find additional capacity from the existing resources by eliminating waste, or non-value-added activities that inflate cost, lead times and inventory requirements. Others define it as the setting of standards aimed at continuous improvement. It was created about 50 years ago when Japanese automaker Eiji Toyoda returned from a trip to Detroit determined to achieve the same production numbers as U.S. automakers, but with more efficiency. Along with partners Shigeo Shingo and Taiichi Ohno, Toyoda developed a system designed to minimize any resources that added no value to the finished product. Called the Toyota Production System, it has become known as the earliest form of lean manufacturing.

- Experts agreed that lean manufacturing was not possible without a system of participative management - a method of labor management relations that emphasizes trust through practices such as providing employees ready access to information needed to do and improve their job, offering an incentive compensation system, and providing business literacy training.

In speaking with experts across West Michigan about these two principles, we have found several common best practices that aid in their implementation and long-term success. We also have found agreement on one truth that makes the West Michigan business community stand out: When compared at a state or national level, Holland/Zeeland companies have a distinct advantage in the implementation of lean manufacturing processes because of the cooperative workplace environments that are embedded in our community. The companies that are thriving in 10 years will be doing so because they embraced lean manufacturing and participative management practices and used them to their competitive advantage.

Unique Workplace Environment

Russ Scaffede, vice president of manufacturing for Tiara Yachts and former vice president of Toyota’s Georgetown, Kentucky, plant, is recognized as a world-renowned expert in lean manufacturing. He is chairman of the Shingo Prize For Excellence in Manufacturing Board of Governors - a position that offers him a wide and well-informed perspective on the state of manufacturing today.

“I haven’t heard of any one community that has the past history of labor management relationships that allow the ability for lean to be successful as a total community any more than West Michigan,” Scaffede said. "I think by far we have the best opportunity if we don’t blow it.”
Scaffede sees strong links between lean manufacturing and the principles of the Scanlon Plan organization. Scanlon developed four principles managers can use to increase trust and cooperation in their organization - identity, participation, equity and competence. Lean is what allows those Scanlon principles to flourish, Scaffede said.

"Scanlon [principles] have been successful in other pockets around the country but I don’t think they have been as successful in any one pocket as they have been in West Michigan,” Scaffede said. "Couple that with the advent of lean in the country, and I think it leaves a leadership team and a work force here in West Michigan that is much more adaptive to those types of changes than the traditional labor-based areas or certainly the traditional big areas that are Titanics to change.”

Gentex Corporation representatives Kurt Wassink, director of recruitment and employee relations, and Douglas Meyaard, department manager - IEC manufacturing, agree that the workforce in West Michigan is highly receptive to lean manufacturing principles when the initiative is approached properly.

"You don’t get a lot of ‘that’s not my job’ comments here and you have people striving to attain stretch goals,” Wassink said. "In some companies people work to maintain minimum standards while avoiding change. It is the mindset difference between following a minimum standard and visualizing how to exceed expectations that makes the difference.”

Meyaard said the workforce tends to trust management more in West Michigan than in other areas. "I think it’s because there have been so many privately owned companies that have been started and run by people who have proven they could be trusted and who have rewarded their employees properly.”

In a survey conducted in 2003 by Wirthlin Worldwide and West Michigan Works, results showed members of the Holland/Zeeland do indeed perceive something different about the community and the way its employers and employees interact.

When asked whether they think things in their community are going in the right direction or whether they have gotten off on the wrong track, 77 percent of Holland/Zeeland residents said the community was going in the right direction, versus 69 percent of people who live across the state.

Holland/Zeeland employees consistently gave their employers higher grades than others across the state for the following: providing a safe work environment, giving a sense of pride, being caring, being honest, providing good wages and benefits, being faith-based and teamwork, or creating an environment where management and employees can work together.

And Holland/Zeeland employees consistently described their employment environments with the following traits more than others across the state: stable and well established, able to get things done, diverse jobs, innovative, good wages and benefits, visionary and reliable, according to the research.

Furthering lean principles allows Gentex to invest more in its future as a West Michigan employer, Wassink said.

"We strategically view lean as an effort for us to be able to stay in West Michigan because the more efficient we make our processes and the more technology-based, the less it makes sense to move somewhere else in the world because our direct labor becomes such an efficient operation, hourly wages become less of a decision making tool,” he said.

Companies who continue to embrace lean manufacturing and participative management principles do so because they see a direct link to lower costs, higher quality, increased responsiveness to customers and higher employee morale. And as more and more companies experience success under these principles, other companies are being called to embrace them.
Royal Plastics engineering manager Randy Eldred, who began leading his company down a lean manufacturing road in the summer of 2004, said the following about companies that have not started the lean journey: “I think you should expect to be asked by your customers, ‘Why aren’t you doing that?’ and be able to give a reason.’”

Knowing that West Michigan is fertile ground for successful lean implementations, experts were eager to share their experiences. Several common best practices emerged:

Lesson No. 1:
Company leadership must set lean manufacturing as a priority in order for it to be effective. Then, it must infiltrate the entire organization as a total organizational and cultural shift.

The impetus to get lean going must come from the top of an organization, and it must be stressed so heavily as an integral way of doing business that it infiltrates every part of the organization, and thus gathers the momentum needed to last.

“You can get it going, but if you don’t have a leader like a John Donnelly Sr. or a G.W. Haworth or a Leon Slikkers who is there every day making it work, the minute they walk away it will flounder,” Scaffede said.

Such leadership also ensures that a lean initiative won’t be derailed and become another “flavor of the month” business effort.

“What very few companies in the United States have been able to do is [establish] the sustaining power to get the lean participating model to the point that it’s such an embedded operating system that even if the company is bought or new leadership comes in, that this is still the way the company operates,” Scaffede said. “You as a new leader will either have to conform to it or you won’t make it.”

Royal Plastics leadership took the initiative last summer to shift Eldred into a position to lead the lean manufacturing effort after reviewing its 2004 strategic operational plan. "It got to be June and we said, ‘We haven’t put our money where our mouth is,” Eldred said. “We had a plan and we were not following it well in this area, so we took action.”

Gentex saw similar action from top leadership. "We were definitely encouraged to do this by the CEO of the company, Fred Bauer, but to be a truly lean company, to do it in a world class way, it has to be something that infiltrates the entire organization,” Meyaard said.

Understanding the need for a total organizational shift for lean implementation to be successful and sustained, Haworth has an active program to identify the ideal “Lean Culture” at each site, and, using behavior assessment tools, to create action plans for their members to change their behaviors. Thus, change and change management become part of their everyday life.

“Haworth created a leadership practicum to ensure its supervisors and managers behave in a way that aligns with lean principles and creates a culture for participative work teams,” said Cozette Tournell, TPM support manager. As part of the effort, 20 people from human resources and 20 people from operations were trained in the use of Organizational Culture Inventory, a tool that measures organizational culture by assessing it in terms of the behaviors that members believe are required to “fit in and meet expectations” within their organization. Haworth continues to use this tool once a year as barometer of the current culture and how that compares to the ideal culture needed to sustain lean and a participative environment.
Tournell said that Haworth, recognizing that lean principles have transformed manufacturing processes, is now focusing more of its attention on applying lean principles at corporate headquarters. The principles all apply to information flow, paperwork and office functions, but the application outside of manufacturing requires creating a new vocabulary and new simulations for training.

Ron Dillon, Haworth’s vice president of manufacturing operations in Europe, said that when the lean effort started, company leaders including G.W. Haworth and Dick Haworth attended meetings at which members working on the production floor would make reports about their lean progress. Their presence and the congratulations they offered went a long way to encourage members and show leadership backing of the effort, Dillon said. As Haworth’s work teams continue to embrace lean manufacturing, executives still relish opportunities to hear about their progress.

**Lesson No. 2**

**Lean manufacturing will not be successful without employee understanding and participation.**

We knew all along that lean manufacturing and participative management were linked, but we did not know just how emphatically our experts would insist that lean manufacturing is not possible without employee buy-in.

Bill Bundy, vice president for Trendway, said lean must be implemented with the participation of employees, or it will not be sustainable and will fail. At Trendway, Bundy and his team during his first year held weeklong kaizen events once a month for a cross-section of people from various departments.

"That was their job for a week, and improvement was implemented," he said.

Trendway continues to hold shorter kaizen events on a regular basis. The education process began with the basics of lean manufacturing - process mapping, one-piece flow versus batch production, and takt time - which the team taught using simulations that allowed employees to see the real-life implications of the principles.

Bundy remembers one employee who was very skeptical of the change. Trendway began using lean principles in its flipper (the doors on overhead desk storage areas) production area in the summer of 2002. At that time, Trendway was using 2,000 square feet to build flippers and the total elapsed time for production was about six hours, most of which was time sitting in stacks or being transported. Now, Trendway builds flippers in a 750 square-foot space, the elapsed time is less than 50 minutes, and productivity has doubled. The same employee later came back to Bundy and said that he had seen lots of “flavors of the month” come and go, but this one he liked and felt it was here to stay. "He liked it because he was part of it, and things improved for his team," Bundy said.

As part of its education process, Royal Plastics held meetings for team members to show what waste they had found after doing value stream mapping - a process to determine the value added to a product as it goes through a manufacturing process. Once they had identified waste, a large part of finding ways to improve involved listening to the people who knew their jobs best, said Royal Plastics manager Rick Kimber.

Kimber and Eldred frequently asked themselves whether they were moving too quickly in the implementation. “Our rule is that it has to last,” Eldred said. “It can’t be a flash in the pan and then go away. The ultimate goal of lean manufacturing is that it becomes a way of life, not a fad.”

A key of employee participation is giving employees the tools they need to implement change, Eldred said. “I was personally amazed at how many issues the team was good at dealing with, but did not necessarily have a lot of hope on how to eliminate it. As we implemented improvements, our focus was also on getting operators more direct control over their destiny.”
That process meant putting more tools in the hands of team members, including providing assembly workers with scanners and making them responsible for inventory accuracy. As a result, inventory accuracy improved by 42 percent. The materials group created an automated Excel-based scheduling tool to improve what had been a predominantly manual process, resulting in a savings of $50,000.

At Tiara, Scaffede also focused on education, scheduling meetings from 3:30 to 4:30 p.m. on Thursdays for about three months to teach group leaders and manufacturing leaders about the Toyota Production System.

He stressed that along with more employee participation, the expectations for manager-level leaders also changes. "If you’re any kind of autocratic leader, you’re not going to make it," Scaffede said.

But, he said, people are wrong to assume that a system which encourages consensus is lenient and lacks discipline. According to the Japanese understanding of consensus, "every person has an opportunity to voice their opinion. Then the leader, who will usually take the predominant opinions, has the responsibility to make a decision. The understanding is that once we leave, everybody will go that direction,” Scaffede said.

Employee buy-in was always on Meyaard’s mind as Gentex implemented lean. "People do things because they desire to, or because they understand why they need to do them, or because they are told," he said. "I think we had a mixture of people. Hopefully now we have more people who have an understanding and desire.”

"If we had forced it and not considered those individuals it would have been much more difficult for me personally to be involved in.”

"We took the time and said that as part of this, people need to understand,” he said. That fits with one of Gentex’s company foundations of unpretentious management. For example, the company’s manufacturing Technical Team Leaders are expected to jump in and run the production lines as needed. “Not only do they represent leadership for their people, they actively participate and can do all the functions on that line,” Wassink said.

**Lesson No. 3**

**An incentive process for small, incremental improvements is crucial.**

To say employees have the power to change their jobs and the way the company operates is one thing. But it must be backed by a commitment to ensure that no suggestions fall by the wayside without investigation, and to reward employees for their suggestions.

Scaffede points to his experience at Toyota’s Georgetown plant for an example of an employee suggestion system that encourages two key ingredients: 1) hundreds and hundreds of small suggestions implemented rapidly and 2) team suggestions. Under the system, it was valid to turn in a suggestion that pertained to someone else’s job, but before you could submit it, you had to partner with the people involved and get them to agree. "If they said yes, we will be on your team to help make that improvement, then it was a valid suggestion to write," Scaffede said.

Secondly, the incentive system was geared to the small improvements and to reward teamwork, based on the number of points employee received. "I don’t want you out there looking for the $10,000 reward, I want you looking for the $1 and $2 rewards, and I want a bunch of them, plus I want you working as a team. You put them all together, and it just got huge,” Scaffede said.
Gentex holds team meetings twice a month called continuous improvement meetings, Meyaard said. Team leaders then attend another continuous improvement meeting twice a month with their support staff, including maintenance technicians and process engineers to track any possible improvements. Support staff members then have a weekly meeting with their manager to rank improvements based on priority, urgency and impact on quality. Every suggestion must be followed up with either implementation or an explanation as to why it would not work.

Haworth’s suggestion and incentive program called Ideas, which has won national awards from the Employee Involvement Association, is currently being updated, according to Bob Milstead, director of Global Quality. The program was used not only to reward employees for their suggestions, but also to measure the success of the lean initiative.

Lesson No. 4
When in doubt, focus on fundamentals.

When Royal Plastics set out to implement lean strategies, they gathered input from many of the same West Michigan experts we talked with. That, coupled with much research of their own, left them with one message: start slow and small. They chose the 17 basic tenets of world-class manufacturing and the seven deadly wastes as their focus to begin (see end of article).

"Get the basics from world class manufacturing and lean [manufacturing] and apply them." Eldred said. "If you take the approach of looking at everything you do based on the value stream and value-add, then you are looking at things in a new way than you probably have in the past. It starts to expose waste… until you can identify it and isolate it, it’s an invisible waste and you are just flushing money."

They were impressed with the willingness of other companies to help them along on their journey. “There is a camaraderie about this being the right way to go,” Eldred said. “In other business aspects, there naturally is a secrecy, but we have found that companies are willing and eager to share lessons learned in lean manufacturing.”

Lesson No. 5
Experience at West Michigan companies shows that companies who embrace lean principles will see results including reduced costs and improved productivity.

Each of the companies we spoke with has a unique lean manufacturing journey and results.

Gentex: In late 1997, Gentex used an opportunity to combine its assembly and glass areas to also begin introducing lean processes.

“That’s when we started trying to make the processes more streamlined because we had batches of material in between the two areas and even though they were directly related to each other, we didn’t communicate as much as we could have,” Meyaard said.

Gentex, as a tier one automotive supplier, worked with the Toyota Supplier Support Center, with consultants coming in two to three days per week for about 18 months to help guide the implementation of lean practices. When the Riley Street building was constructed in 2000, it was designed to house lean processes.

The process efficiencies that have resulted from their lean implementation meant that in 2004, with an eight percent increase in revenues to a record $505.7 million, the company added little direct labor costs.

Their results include more standardized procedures (including less operator interfacing with the product) and reduced inventory on hand. They also have higher product quality and less waste as a result.
“Before you could produce a whole shift worth of sub assemblies with potential quality issues and not be aware of it until you started on that batch of 5,000 in the next shift,” Meyaard said. “Whereas now, in almost real time those issues can be identified and corrected.”

In the future, Gentex will be focusing its lean journey on finding ways to make its newer, automated processes more lean and working with suppliers.

“Just as Toyota helped Gentex work toward becoming lean, the same pressure to work with our suppliers begins to grow. If we continue to improve our lean processes in manufacturing and in our warehouse, but a supplier still delivers huge quantities of inventory for us to store, the overall efficiency is still limited,” Wassink said.

**Tiara:** The fundamental lean principles including build-to-order and one-piece flow take on new meaning when the product being created is a yacht. When Scaffede joined Tiara two years ago to implement a lean system, he had an opportunity to apply the fundamentals from his days in the automotive industry to a new product. The obvious main difference to automotive was the extended team member TAKT time measured in days and hours, as well as the complexity of the product for process development.

He quickly formed a Tiara Production System office based on a design he has found successful in other lean implementations. The office fluctuates from three to five hourly workers, usually those who have been identified as future leaders in the company. They are assigned to one-year rotating assignments to carry out various projects related to the lean implementation, Scaffede said.

Tiara had always operated under the system of building boats to order when they are sold. “We certainly don’t have to worry about built up unsold inventory. In the field however, the company does monitor inventory sold to the dealers as an indicator of how the economy is developing,” Scaffede said. “All we had to worry about was continuing to develop a system that can react to those few times when we hit a down market.”

While working on improvements in productivity on one of the lines the Tiara team members have taken about 400 minutes out of the deck set (the process when the hull and the deck of the boat are put together) and 150 minutes out of engine installation. “The team members all agree we can increase productivity (reduce TAKT time) in those areas without adding people, however if we can not sell more boats, we are on going to increase production either,” Scaffede said. “Since we cannot reduce any processes with this time savings we haven’t saved the company a penny yet, but we now have a mindset among the team members who understand what the waste is. Within another 18 months we will be able to show our Tiara Annual Plan goals report that will encompass these savings and will start to drive the bottom line numbers for improvement”.

Tiara also moved from a hoist system that took two and a half hours to move a boat from station to station to moving the assembly lines using rolling cradles. At the same time, the company combined its two small boat production lines and two big boat production lines into two blended lines, Scaffede said.

From a material delivery standpoint, an internal kanban system has been established delivering components to the assembly lines. Tiara accomplished its goal of staying below three and a half weeks for raw materials on hand in 2003 and in 2004 nearly met a highly ambitious goal of two and a half weeks.

**Royal Plastics:** Focusing on fundamentals led Royal Plastics to deploy change in a controlled manner, and they immediately began seeing results. As mentioned earlier, by providing scanners to assembly workers and making them responsible for inventory accuracy, the company improved inventory accuracy by 42 percent. Deploying an electronic scheduling system to assembly with a regimented ordering schedule by bay saved over $50,000 a year.
And having machine operators travel to molding to perform secondary operations for seven higher volume products, and thus eliminating steps in the process, resulted in savings of $56,000. The subsequent action of molding taking full ownership of three of the seven products saved another $15,000.

"We basically asked our people to be uprooted on a rotational basis to perform their assembly operation adjacent to the press molding their parts," Eldred said. "That went much better than I thought it would, and I think nine-tenths of that was because everyone understood that we were trying to eliminate waste."

Royal also reorganized one large team into four cell teams in order to achieve better quality. In the past, all assembly operators rotated through all jobs to avoid ergonomic problems. "However, there were quality issues because there was too big a rotation. So when we broke into four cells, we still have sufficient rotations and we have improved our quality."

Embracing visual factory tools and rules and 5S audits resulted in highly improved work area organization. (5S are five terms utilized to create a workplace suited for visual control and lean production - sort, simplify, scrub, standardize and sustain.) And live posting of quality audit results and posting key measure results have eliminated delays and miscommunications between shifts as well as given operators more ownership of the process. "Now you can see where people are taking responsibility for the percent on time," team leader Darlene Barrett said.

Trendway: To create one piece flow, Trendway developed three different takt times (the rate or time that a completed product is finished) for three levels of business activity - slow, average and peak. With every employee cross-trained, team members can be reallocated to other areas depending on the activity level.

Their efforts have results in much reduced late and partial orders - from 96 percent on time in 2000 to 99.9 percent in 2004. "That means we are late on average once every two years to a dealer who places 10 orders per week," Bundy said. "We meet every day to talk about anything that could be late."

Their labor costs as a percentage of net sales has improved by more than 40 percent since 2001, Bundy said.

And employee morale is high, if you talk to Trendway employee Dawn Cooper, who has become a vocal proponent of lean for the company. On a recent visit, she explained that before the lean implementation everyone’s job in the production process took a different amount of time, so as some finished their job, the product was stacked before the next employee in the process could get to it. "It was very stressful for some people," she said.

Now, with the principles of one-piece flow in action the workers are less stressed as their work throughout the day is more steady and dependable - and they are more productive. Implementing 5S principles also made the work environment less cluttered because, she said, "Everything has a place."

Dawn loves to tell the story of when she was asked to accompany Trendway leaders on a trip to a supplier plant as part of Trendway’s effort to spread lean principles to its suppliers. (Bundy said the company’s policy was that when a supplier would raise its prices, Trendway would only consider the increase if they were allowed to come and do a kaizen event.)

"It was a mess," Dawn said. "There was WIP (work in progress) everywhere. It was an absolute mess. I said to myself if the only job left on earth was here, I would not take it."

After the kaizen, they returned to find the company a 250 percent increase in production per hour and a 60 percent reduction in WIP.
Haworth: Haworth’s heritage as a lean and JIT leader began in the mid-’80s, but it formally launched its lean implementation in 1998, a year of high sales. From 1998 to 2001, its system of total process management (TPM) swept through all its U.S. plants and in 2001, they started value-stream mapping. Its European plants joined the effort in 2002.

Among its recent efforts have been a process of supply chain synchronization -coordination of the process from order entry to installation. Job site teams were deployed to inspect the delivery to the dealer and installation on site and apply the basics of lean manufacturing to the installation process.

"What we found is that the customer world is a lot different from what we thought it was,” said Joseph Bardowski, director of logistics. “We have been isolating what are the best practices to have a perfect installation.”

Haworth has seen its manufacturing lead time (the time that an order is received to the time manufacturing ships the order) improve from two to three weeks five years ago to two days or under now. The goal is to reduce it to fewer than 8 hours, Dillon said.

Dillon was recently transferred to Germany, where he will further the company’s lean efforts in its European plants. Along with its emphasis in Europe, Haworth also is working to further lean efforts in its Asia Pacific facilities.

Lesson No. 6
Lean is a journey. You’re never finished.

Without exception, our experts view lean as a journey that will never end. As defined under the Toyota Production System as the “absolute elimination of waste,” those striving for lean manufacturing will presumably always be striving for that absolute.

"We just don’t want compliance,” Eldred said. “We want every single person scrutinizing what we do and why we do it and coming up with those improvement ideas because they know best.”

As West Michigan companies strive to attain that absolute, they are increasingly finding they are not alone. And in true West Michigan style, those who are further along the journey are helping along those who are just embarking.

Unlike many places where employees and employers look at each other as opponents with competing goals and interests, and where neighboring businesses view one another with suspicion, in West Michigan we are part of the same team. Our employers and employees respect each other, trust each other and work together toward the common goal of building the best products they can in the best environment possible. And our neighboring companies know together they must invest in the future of West Michigan by sharing their successes and challenges as they pursue business principles proven to strengthen productivity.

The lessons learned here are crucial to that future.
**Good Management of Manufacturing**  
*From Richard Schonberger’s principle of world-class manufacturing*

1. Get to know the customer.  
2. Cut work-in-process.  
3. Cut flow times.  
4. Cut setup and changeover times.  
5. Cut flow distance and space.  
6. Increase make/deliver frequency for each required item.  
7. Cut the number of suppliers down to a few good ones.  
8. Cut the number of parts numbers.  
9. Make it easy to manufacture the product without error.  
10. Arrange the work place to eliminate search time.  
11. Cross-train for mastery of more than one job.  
12. Record and retain production, quality and problem-solving data at the work place.  
13. Assure that line people get first crack at problem-solving, before staff experts.  
14. Maintain and improve existing equipment and human work before thinking about new equipment.  
15. Look for simple, cheap, moveable equipment.  
16. Seek to have plural instead of singular workstations, machines, cells and lines for each product (modular vs. mega-line).  
17. Automate incrementally, when process variability cannot otherwise be reduced.

**Seven Deadly Wastes**  
*From Toyota Production System*

1. Overproduction  
2. Waiting  
3. Transportation/Double handling  
4. Over-processing  
5. Inventory  
6. Motion  
7. Producing defects