



WHEN LEAN BECOMES A PASSION

Mysore Kirloskar Hubli (MKL) was the first full comprehensive lean transformation in India; where to achieve reduced costs, shorter lead times, improved quality, greater customer satisfaction etc, the company made a long-term philosophy decision to move away from batch production (PUSH system) to Just-in-Time (JIT or PULL).



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The thinking we developed at Mysore Kirloskar Hubli was to do the right thing for the company, customer, employees and the society at large. We developed one single common price for all customers and ensured that no two customers paid different prices for the same product.

For MKL, this change in the manufacturing strategy from PUSH to PULL was a cultural revolution. Our two major intents were to produce and deliver products in small quantities, with short lead times to meet specific customer needs including day to day shifts in customer demands (JIT), and to have a built-in-quality in our products (Jidoka).

Process chain

To define customer values we spoke to over 10,000 customers

and analysed their requirements. We developed the demand rate as a predictability tool and used it to forecast the most likely market trend. We redesigned the value stream and made the value flow governed by a flow rate. Flow rate defined purchase ordering and the rate at which material would flow through the value stream. Purchasing was authorised only based on firm customer orders. This meant we were actually pulling from the customer backward. Hence there would be no pile up of inventory.

In a one-piece flow, when a production problem occurs, the whole line stops. When production stopped we converged on the Gemba to solve the problem and eliminate it – continuous improvement. This culture built better teamwork and assisted in the growth of team members. Shortening the time from raw material to finished goods led to better quality and lower cost.



Toyota Group delegation appreciating the work of quality circles

Lean thinking

Traditional processes think it takes days or weeks to complete; whereas lean thinking accomplishes the same in much lesser time. We achieved amazing results through better layouts and flow of material that did not have wastes. We looked at every area as a huge potential for improvement. We reduced overproduction by strictly adhering to the 'pull quantities', which were reduced every time we achieved lead-time reduction. Multi-skilling our operators eliminated any process waiting.

Every time process improved manufacturing lines were relayed. To us flow meant that when the customer placed the order, it would automatically trigger the process of ordering material and production. Our achievement was the flow of a single piece with the same velocity as would many. This was a mindset achievement.

We reorganised the entire factory into lean manufacturing cells by continuously changing the layouts, creating continuous process flow and bringing problems to the surface. Most operators were multi-skilled. I had empowered the operators to stop the process if there was anything incorrect with it. They did, we went to the spot and solved problems. Quality circles within the cells became active at solving problems. We passionately built a culture to focus on the root cause of a problem and eliminating it. Problem solving boards, data, fishbone diagrams, analysis, and action plan sheets were visible all over the place. Sharing the learning continuously made us a learning organisation.

We leveled the work to a great extent. A machine was allowed to stop producing parts once the ordered quantity was achieved. To level out the flow of material, finished goods stocking was authorised at the rate of one week's flow rate. This translated itself into visual signaling Kanbans of proportional time sizes at critical stages. We found this better to start with rather than produce against a daily fluctuating demand. We simplified the whole system by not keeping it in the computers but by transferring it on to the shop floors through a visual

signaling system and under the eyeball control of the operators.

One third floor space released because of improvements was now used to house new assembly lines of CNC machines and other new products. Focusing on quality more than cost actually brought down the cost; coupled with standardisation, rationalisation and re-engineering, we succeeded in passing on huge cost benefit to customers.

Push philosophy cannot adapt to changing customer demand, hence accumulates huge inventory. A 'very ideal' form of one-piece flow may be hard to achieve. To balance the pull, cycle times and inventory by using simple visual techniques for managing flow of material in the JIT system. As orders came in from the customers, we created a leveled schedule through 'flow rate'. Flow rate was indexed to lead times. The batch size on the signal cards automatically changed with either change in flow rate or lead times.

The success

Besides my personal work ethics, the reason for our success in this cultural change was that we worked on the human character and the emotional side, rather than mindless tool application. This built the character of applying tools to solve problems. We used to stop the process in case it was producing defects with an intent to get the quality right the first time. In the short-term it created havoc. But we stayed with the intent. With low levels of inventory, short lead times, lean manufacturing dramatically increased the importance of building right the first time. This is the Jidoka philosophy. Our success is attributed to intensely working on problem solving, error proofing, and training people to actively participate in Quality Circles, 5S et al.

In our effort to simplify the processes and make them easy to control, we used the visual control technique. We used a very simple though excellent ERP 'tool' developed in-house and decidedly had no production module to it. When we



“It is one of the top stories of total lean enterprise transformation from sales to product development to manufacturing, to delivery”

Jeffery Liker,
author of the book -
The Toyota Way

re-engineered; the managers were reallocated jobs utilising their competencies to the hilt. To us the customer always came first, people were treated as most important asset, and I strongly believed that while machinery depreciates people appreciate in value. We believed in seeing the problems visually and solving them. Kaizen, JIT, Jidoka and effective thinking built a supportive culture.

Supplier relationship

One of the key reasons in our success was due to the respect with which we treated our customers, partners and suppliers. We helped our dealers & suppliers to improve and become

more effective. Dealers were constantly trained, given written down policy guidelines, and we treated them as the most important person on the premises when they visited. Suppliers were identified and not only trained on the philosophies now used in-house, but their shop floors were reorganised and relayed with the pull concept. We challenged them to solve problems. Some good suppliers were upgraded to tier I by supporting them in supply assemblies. Our fast paced improvement and growth also stemmed from our getting to the grass root levels every time to solve problems and making sure the same cause never repeated. We made decisions by consensus after considering all options.

Building the lean culture

We built the lean culture by developing lean thinking among employees, suppliers and partners who reduced lead times everywhere. By raising the bar on developmental lead times for new machines, we have left behind a benchmark for developing a whole new product portfolio from ‘concept to customer’ in less than one hundred days by using concurrent engineering and developmental techniques. This was the speed with which we responded to recession and no-order situation. The lean culture went beyond our factory walls to include suppliers, partners and customers otherwise there would be no shared gainful advantage. We built successful supplier clusters, with the concept of focused factory layout, process flow, and single piece production operating on the “pull” from the main factory’s signaling points.

Conclusion

Relentless reflection and continuous improvement dramatically improved our business processes, eliminating wasted time, activity and resource, building quality into work place systems, finding low cost reliable solutions to expensive technology, perfecting business processes and building a learning culture for continuous improvement. □

THE BENEFITS OF IMPLEMENTING LEAN MANUFACTURING MEASURED OVER A PERIOD OF THREE YEARS			
S NO	MEASUREMENT	BEFORE	AFTER 3 YEARS
1	Product build times	30-45 days	2-3.5 days
2	Manufacturing lead times for major components	45-60 days	1-2 days
3	Quality index – rejects, rework & non-conformance	33%	0.3%
4	Inventory turns	1.5	17
5	Product varieties	3	8
6	Product models (variants)	7	30 plus
7	Standardisation and rationalization, reduced part numbers (SKUs)	15,000 nos	840 nos (<6%)
8	Floor space reduced	Nil	33%
9	Sales turnover	100	500%
10	Surplus revenue growth	Best ever	15 plus times
11	Market reach enhanced (dealerships)	12	72
12	Permanent cost reduction to customer (ultimate test of going lean)	Nil	30% (this is permanent price change, NOT discount)
13	Customer satisfaction index	44%	97%
14	Manpower	840 nos	640 nos
15	ERE to sales	26%	6%
16	Lead time for new product development	180 days for one machine	100 days for an entire portfolio of new products
17	Motivation levels	Average to low	Very High to Excellent

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