

# Lean Thinking in Purchasing & Materials

A case study by Chris McKellen

*'Just apply some lean manufacturing  
and change the way they do things'*

The Vice President for Europe of first tier automotive components manufacturer, who has asked to remain nameless - called me in to his office one day in 1998 and said *'Just apply some lean manufacturing and change the way they do things'*! Over the next three years we revolutionised the business – less people, better technology, shorter lead times and lower costs!

The company had been a traditional British engineering company which had been taken over by the USA based parent company some years before. For many reasons, the company had changed from being a cash-cow to a problem facility. It had a huge amount of inventory (US\$ 14 million) an aging MRP system, shortages and missed shipments every day! Both customers and suppliers were becoming unhappy.

As with all 'lean thinking' programmes, it was important to look at the people first. There were too many and roles were duplicated – purchasing expeditors chased parts from suppliers and then the materials department expeditors chased the parts through the plant! The solution was to merge the departments – unfortunately phased job losses were required over the next 18 months – with new more involved roles for almost everybody and a major effort to develop team working.

The management team agreed to adopt the principles of the Theory of Constraints. Two-hour training sessions were needed for each of the 500 employees in the company. More intense sessions were held for the supervision, management and the combined purchasing / materials departments. This new culture enabled traditional practices to be changed. The bottleneck machines were identified and these became the machines that were planned for production, rather than the first machines in the production lines. The concept of flowing parts through the production lines, instead of machining and assembling in batches, was introduced. Immediately, internal lead times started to reduce.

The concept of daily 'Schedule Adherence' was introduced. 'Credit' was only given for parts that were completed exactly on time and absolutely no 'credit' was given for parts that were manufactured in excess of the schedule. The three main machining areas of the plant were scheduled together so that components arrived at assembly in a synchronised manner and the final assembly could be built without shortages and shipped on time! Of course, the concept of schedule adherence was the complete opposite to the traditional method of manufacturing components to recover overhead – making unwanted parts to make the daily financial figures look good.

At the same time, inventory was being attacked. Two major off-site warehouses were addressed – one was for surplus inventory and the second for holding raw materials. Both were closed. The surplus inventory was analysed – obsolete and slow moving materials were identified and the surplus 'current' inventory was

used for production enabling some materials not to be purchase and components not to be manufactured for several months. A new raw materials store was established within the plant and suppliers were encouraged to deliver two or three times per week using timed delivery slots. Over deliveries were not accepted. If suppliers were overseas, they were encouraged to hold materials at their expense in bonded warehouses away from the plant.

### **Audit the information systems!**

It was time to address the MRP system. We looked at introducing a new ERP system with a finite scheduling system for 'what-if' simulations but the costs and lead time were prohibitive. If we were to have a new system, we would have to cleanse all the data, so why not cleanse it now?

Every Bill of Material was checked and almost every one of them needed correcting in some way or another. The parameters for every item master for every live part were checked and again, many variables were changed including batch sizes, re-order levels, scrap allowances, lead times etc. In assembly, a bearing 'cup' is used with a bearing 'cone' – why were the reorder levels for cups and cones different? Why was a twelve week lead time allowed for castings from Portugal when the actual delivery time was 6 days? Why were batches of 500 components machined when only 50 were used per week?

Previously, before MRP was run, a mini stock check was done to improve the accuracy of the MRP and, after a night of computer time the MRP, results were analysed and amended manually based on experience. It could take two weeks to issue the new schedules! We introduced procedures to get stock under control and eliminate major stock losses. Following an annual stock check, and after introducing the changes to the parameters, we decided to believe the output of MRP and we ran it every week rather than monthly! New supplier schedules were only issued monthly, or when there was a 'significant' change.

Inventory - raw materials, work in progress and finished parts - were being reduced significantly (US\$ 6 million in twelve months) as were internal manufacturing lead times whilst the concept of planning the bottleneck machines and schedule adherence almost eliminated the need to expedite. So what was happening with suppliers?

In a twelve month period the plant had used just under 1000 suppliers, supplying everything from machine tools to nuts and bolts and from bags of cement to castings. The number of suppliers was almost unmanageable and the costs associated with purchasing enormous. Some suppliers had supplied the same components for many years, some had not had price increases for five or six years, many had become complacent and some were at the stage of being ready to stop supplying due to the constant demand for price reductions. Several suppliers supplied the same commodity, quality was secondary to price and drastic action was necessary.

A series of supplier days were held to explain the strategy – the number of suppliers was to be reduced, theory of constraints and schedule adherence were being adopted and schedules were 'the bible'. We would pay for whatever the schedule demanded, and all 'instant arrears' created by MRP would be eliminated. We expected suppliers to work to the schedule which would be firm for two weeks and we wanted to develop 'true' partnerships where both pain and successes would be shared. We started to train the suppliers in our new philosophies.

### **Simplify the supply chain!**

Many small components such as brackets were purchased from a large number of smaller suppliers and through discussion and negotiation we transferred their business to an 'integrator'. For a small mark up, the integrator acted as a middle man and purchased our components, from the original supplier, and supplied them together with all fasteners to his free issue racking area – component quantities were checked and replaced as necessary on a daily basis. The involvement of the integrator reduced the number of suppliers considerably, eliminated hundreds of low cost items from the MRP and introduced the concept of Kanbans. Part of the agreement with the integrator was to have a year on year cost reduction which necessitated him achieving economies of scale by providing a similar service to other companies.

Having transferred many small components to the integrator, we then needed to obtain some leverage with the suppliers of our raw materials. Here major surgery, based on quality, service and price took place and the number of forges and foundries was reduced in a very short time from 22 to 5. Again, the need for trust, tolerance, honesty and understanding was essential. Some years ago, whilst working in Asia, I was told 'business is business and people are people', but here we adopted the philosophy that 'business was people' – only by establishing trusting relationships would we all succeed.

Novel thinking was required to reduce the number of indirect suppliers. We had 13 suppliers of carbide tooling – all supplying almost identical products. After a meeting with the top seven by spend, each was given one month to propose how they would become our sole supplier and to carry out any trials that they wished. One supplier was selected on merit and provided twenty-four hour on-site service, technical support and automated tool dispensers. Tools were obtained by swiping a card through a reader on a 'vending' machine and the machine automatically re-ordered the tool from Sweden – better service than we had ever received! The supplier also agreed to Europe-wide pricing – the same tool would cost the same price in Italy, France or the United Kingdom.

Similar schemes were set up for lubricants and chemicals, for small tools and general supplies and for maintenance supplies. The important part of these supply contracts was that the supplier would become the sole supplier and he would supply his competitor's products if he did not have an equal or better product in his own range. In each case, the chosen vendor established and managed their own mini-store. We only paid for items as they were used.

### **Use appropriate new technology**

In parallel to the physical changes that were taking place, the parent company was looking for pilot sites to introduce electronic purchasing and we volunteered! Using an internet based system, chosen supplier's catalogues were available on-line. A user would log in to the system and select the catalogue and then the item(s) required. Their requisition would automatically be forwarded for whatever approvals were needed and, as the last approval was given, the requisition was converted in to an electronic purchase order to be received by the supplier in seconds. Paper purchase requisitions, the tedious processes of approvals and entering data in to the computer for it to print out a purchase order were all eliminated. Lead times were reduced significantly.

The systems department helped us simplify our purchase ordering procedures. Traditionally, after we ran MRP, several days would pass where schedules were checked, folded, put in envelopes and then sent by post to suppliers. Additional letters would be sent to suppliers advising them of holidays and other significant events. But the internet helped! We supplied our suppliers with a password to a secure internet site and there was their 'live and up to date' schedule. Whenever MRP changed, the schedule changed and we set up a system where we could see if the supplier had actually looked at the schedule. On this same site, we posted notices regarding holidays and kept them up to date with any other announcements that we felt that they may need.

The group also encouraged us to participate in Competitive Bidding Events – internet auctions for our direct materials. A package of data was prepared for a number of similar components – drawings, material specifications, volumes, delivery schedules, conditions of purchase, quality requirements etc. This data was collated on to a CD-ROM and distributed to companies world-wide. Over one hundred companies were invited to bid for a package of similar components from seven group plants throughout the world. At a predetermined time we all logged on to the special web-site and bidding commenced. All companies bidding could see what the other companies were bidding but they could not see the names of the other companies. Prices tumbled! At the end of the event we could then select which supplier we wanted to use and negotiate the final details.

The annual stock-taking event also changes significantly. Rather than taking several days, writing tags and tickets, collating tickets and double checking them, we used bar coding and scanners linked to hand-held computers – again utilising the skills of the computer experts! The time for stocktaking was reduced to less than one day and the accuracy of results was much higher.

### Partnerships for mutual benefit

One major problem always existed in making change – the finance department! They had a mission to reduce working capital – reduce inventory; collect money from our customers in a short time (receivables) and pay the suppliers as late as possible (payables). As part of our developing of partnerships we wanted to pay our suppliers sooner and when using the electronic purchasing system it was advantageous to both the supplier and ourselves to use payment cards (credit cards). We devised and developed a scheme with some partners where we offered a bonus payment of 2.5% for suppliers that achieved 100% schedule adherence in a given time period, and they offered us a 2.5% discount if we made on-time or early payments. Basically the scheme was a zero cost scheme to help both companies achieve customer / supplier satisfaction.

### Measure the success!

The task to '*apply some lean manufacturing and change the way they do things*' was successful and some of the benefits achieved during a 30 month period were: -

Number of Suppliers	reduced by 85%
Purchasing & Materials headcount	reduced by 66%
Inventory	reduced by 57%
Supplier Lead Times (average)	reduced by 60%
Internal Lead Times (average)	reduced by 78%

plus

- Standardised world-wide prices on some commodities
- On time payments / payment card payments
- Introduction of electronic purchasing for indirect materials
- Introduction of on line bidding events for direct materials

### The potential is there!

*Chris McKellen has been involved in lean and agile manufacturing and increasing productivity in several companies for the last 18 years. Today, he has his own training and consultancy company and has published a manual 'A Journey Towards Manufacturing Excellence'. He can be contacted through [www.manufacturing-awareness.com](http://www.manufacturing-awareness.com)*