

A couple of weeks ago, I attended a conference where once of the speakers was justifying 'agile' against 'lean'. His view was that 'lean' left barriers in an organisation and didn't help to change the culture whilst 'agile' did! About three years ago I was asked to write an article for a technical journal which was entitled 'Let's Get Back to Common Sense' and which comments on crusading 'banners' rather than improving business techniques. I have attached the article below.

I have also included the Comments page from Manufacturing Computer Solutions where Brian Tinham, the editor talks about the funds being made available to business in the UK by the DTI

## The AME-UK and You

**T**he AME-UK is:-

- The premier choice for knowledge in Manufacturing excellence.
- Provides relevant opportunities for learning, experience sharing and collaborative problem solving, which are unquestionably of high value and meet the real needs of today.
- An organisation of practitioners who see value in the rich exchange of ideas, experience and guidance.
- Helps, through learning, organisations striving to become vigorous organisations, learning organisations, problem solving organisations and flexible innovative organisations.
- An assist in providing help and guidance to leaders on how to change the working culture into a learning culture that engages all employees throughout an organisation.

## A Message from Bob Davis, AME-UK President

**I**n a journal, I recently read about "21<sup>st</sup> Century Operating Challenges for Manufacturing Organisations", being:-

- Global competition, "Surprises" from anywhere.
- Energy costs and shortages.
- Contracts with built in price reductions.
- More variety at a lower cost.
- Shorter product cycles.
- More complex, customer and field service.
- Quality is a given.

In the AME-UK, we would be really interested to know how you are coping with these challenges.

Perhaps you could let us know your thoughts or comments and how relevant they are to your business. Please reply to Chris at the email address at the bottom of the page.

## £250 million for UK Manufacturing

**The DTI's Manufacturing Advisory Service (MAS) is promising £250 million in improvements over the next three years. But is it what it seems?**

**T**he announcement last month that the Manufacturing Advisory Service (MAS) is to deliver a further £250 million worth of added value' to UK manufacturers over the years to 2008 provided an apparently welcome end to a year most notable for rather less than good news.

Apparently', because £250 million doesn't mean £250 million: it actually means £34 million of public money, half from the DTI and the rest from the Regional Development Agencies in England and their equivalents in Wales. The £250m is merely the improvement in total 'gross value added' (GVA) manufacturers who take MAS assistance might expect to notch up.

That's assuming they match the rates of MAS users since the service started three years ago. Which, again on the face of it, are not inconsiderable. The DTI says we're talking about average recorded improvements of 25% in productivity, 33% in stock turnover, 45% in equipment effectiveness, 26% in scrap and defects, 33% in space utilisation and 26% in on-time delivery.

That amounts to £151 million of GVA for MAS-assist-ed manufacturers since 2002. Which is good, right? Until we hear that the service provided "over 11,000 free diagnostic and advisory visits ... to manufacturing companies and more than 3,000 of these businesses have received in-depth consultancy support of up to 10 days."

So the work with MAS provided each manufacturer

with an average of between £50,000 and £14,000 of gross value added. And taking the other figure paraded by the DTI - 'The MAS programme has handled over 56,000 enquiries from UK manufacturers' - real average GVA is potentially much lower.

Now, do the numbers - either of manufacturers involved or benefits received - look so headline grabbing? And note that while the £250 million GVA to 2008 is a 61% increase on the last three years, it's only a forecast of hoped for improvements, not an unequivocal commitment to UK industry from the public purse.

Alun Michael, Minister for Industry and the Regions, may well be right when he says: The key to the success of MAS has been ... reaching those small firms that in the past have been hard to contact." He may well also be right when he says: "The service has achieved much more than we dared to hope, which gives us good cause to be even more ambitious in helping manufacturers in the future." But for the broad swathe of manufacturers in the UK, 61% on those figures falls woefully short.

No-one should knock MAS: collectively, its deliverers provide great services to those it reaches. But with resources clearly constrained, it's the age old story: you're going to have to help yourself. And that means looking around for what else is available, and those dreadful clichés: 'thinking outside the box' and taking ownership'. In short, investing in some serious strategic review and vision-building - then taking it forward.

Looking for a steer? It's worth noting that the DTI also sponsored the CBI's third annual e-business report, 'e-Value matters: transforming business online', published late last year ([www.cbi.org.uk/bookshop](http://www.cbi.org.uk/bookshop)). That concludes that the online world and its underpinning technologies are key to combating competition, particularly from lower cost, overseas companies - by allowing suppliers, business partners, employees and customers to get closer by "electronically automating and integrating business operations."

It also emphasises that, with the spread of broadband, reducing IT costs and increasingly available services, it behoves UK SMEs to get on-board - and their supply chain masters to help them in doing so. Alun Michael, in his foreword, makes a good case for manufacturing companies and others to take this seriously, warning that those who fail to do so will soon find customers, employees and profits deserting them.

Given the scale of positive impact the report confirms from modern IT (from operational efficiencies to cost reductions, management knowledge and control improvements, employee

empowerment, customer satisfaction, and opportunity and revenue enhancement), time spent with it would be time well spent.

Then it's a matter of priorities, implementation and business change management. Do it all well, and you become one of the winners. There isn't room for much in the way of mistakes though.

## Let's get back to Common Sense

***A plethora of manufacturing improvement philosophies is available, so where should the smaller business start?***

Years ago, the traditional British engineering firm that I worked for was taken over by an American company and my introduction to lower cost manufacturing began.

On one of their first visits, our new American master asked why we were removing burrs from a component - 'you don't do that unless it will hurt the person assembling it or unless the burr will fall off and damage the (rotating) assembly'. I soon learnt that casting or forging chamfers on to the raw material prevented the burrs from being formed when we machined the component.

As my career progressed in other USA owned conglomerates, I was introduced to the philosophies of the Toyota Production System, to Continuous Improvement, Cycle Time Reduction, Kaizen, Lean Manufacturing, Total Quality Management, and Six-Sigma. Today we have added Quick Response Manufacturing and Agile Manufacturing.

An industry is booming around these philosophies, so let me declare an interest! I have practiced and believe in many of these techniques and philosophies and I train people in them! Seminars are held to compare the techniques and learned colleagues write many articles explaining from their view point why each technique is better than, or different to, another. Often the experts seem to be saying almost the same thing but from a differing viewpoint: -

*'systematic elimination of waste leads to continuous improvement'*

versus

*'relentless reduction of lead time results in continuous improvement and elimination of waste'*

But basically, in a 'normal' manufacturing plant, we need to combine all of the company wide philosophies! We need to practice continuous improvement (Kaizen), we need to eliminate waste (Lean), we need to reduce lead times (Quick Response), we need to respond quickly to our customer demands (Agile) and we need perfect quality (Six Sigma).

To learn and implement all of the philosophies will require a library full of text books and months of seminars and time – perhaps several years of training.

So where should the smaller business start?

What are the most important things to consider when running a manufacturing plant?

I believe that they are:-

- **Health & Safety** – we all have a statutory obligation to make sure that the place where we work is safe, that we do not harm ourselves or our colleagues and that we do not pollute the environment.
- **Communication** – if we are open, listen to our employees, talk to them and tell them as much as we can about the business, they may not always be happy but they will generally work well. Good communications with our suppliers and customers are also essential, too.
- **Housekeeping** – a clean organised and tidy plant is a safe plant. And, if it looks as if we know what we are doing, then our customers may forgive us for the very occasional deviation.
- **Quality** – Our customers expect zero defects and will keep coming back if we make them good quality products.
- **Keeping the customer happy** with on time delivery at the lowest possible cost.

But on a more detailed level there are basic day to day issues in every manufacturing plant. Let us assume that we have sufficient customer orders, so what are the primary concerns that we need to address? I would like to suggest that they are:-

- a. Flexibility
- b. People
- c. Inventory
- d. Lead times
- e. Waste
- f. Quality
- g. Delivery
- h. Payments

Each of these has a significant effect on productivity as we will discuss each below.

## A Flexibility

### *Flexibility is an essential component of agility!*

*Flexibility in Process Equipment* – is becoming essential. With the constant drive of customers to change designs of components and to have a shorter product life before new models are introduced, the days of having dedicated process equipment are gone.

Our equipment should be able to process not just one specific component or just one type of component but several families of components and the changeover (set up) time between components must be minimised. The process equipment should allow us several routes for making a component – so that breakdowns, or an increase in business, do not restrict our ability to manufacture parts. As product mix changes, dedicated equipment becomes underutilised but flexible equipment can be retooled.

*Flexibility in Systems* - Customers today demand Just In Time deliveries to meet their daily schedule, and it is already common practice for suppliers to the automotive industry to receive an electronic schedule this morning, stating the exact product mix and volumes that have to be shipped this evening. Our manufacturing processes systems need to be flexible to meet these demands – MRP is not capable of responding to sudden changes in schedules and it can encourage us to build inventory. It does not usually allow us to have alternative routings, or varying set up times. The journey to the airport takes much longer during the morning rush hour than in the middle of the day – so we plan our journey time according to the amount of traffic. Similarly, changing from part B to part A may take much longer than changing from part C to part A, but MRP assumes a fixed set up time for part A

MRP works to set rules (algorithms) and these can often allow us to load our processes in an ineffective way. Whilst MRP is a superb calculator, we can generally prepare sensible manufacturing schedules for our critical machines on a simple PC.

*Flexibility in People* - Our employees like to be challenged! In a typical machine shop, the CNC Lathes and the CNC machining centres have similar control systems so why do we not train our employees to operate both types of machine? If we establish a training matrix showing our employees demonstrated skills, we can reward those who are the most flexible, and we can apply the concept of the training matrix across the whole organisation

and every role. In enhancing our employee's skills we can introduce Total Productive Maintenance where the operator carries out simple maintenance on his own workstation.

## B People

### ***People matter!***

*Employees* - Most of us have invested in our employees. One of my past employers insisted that every employee, world-wide, had a minimum of 40 hours per annum training. Another had a mission statement which started with 'People are our most important responsibility' but this was revised to make shareholder value the priority and people became number 5! Of course, both are very important, but our employees generate the wealth for our shareholders.

The key to having satisfied employees is to communicate with them. Tell them the good news as well as the bad. Hold frequent and regular briefing sessions to ensure everybody gets the same message and in large facilities have a quarterly plant meeting where everybody attends and gets the same message.

Our employees are responsible for our success. When we embark on any major change in our business, such as introducing lean manufacturing, it must be accompanied by a culture change. It is of little use teaching people new tools for the new world, if we do not teach them how to behave in our new world.

*Customers and Suppliers* – People do business and business depends upon relationships. If we communicate well, and treat people as we would expect to be treated and are seen to be fair, then we should continue to be successful.

## C Inventory

### ***Most inventory is a waste and prevents us from being agile!***

Depending upon where it is, and who you are, inventory can be seen to be a good or a bad thing. Let me offer a simplistic view: -

*Good Inventory* – is the minimum amount of raw material that is available to help us manufacture what the customer wants, exactly on time. It can be the managed store of finished parts that we have made with the customer's agreement to protect deliveries to him. Kanbans are good inventory and are easily introduced to eliminate the variations in demand and to ensure that the correct parts are always available. (*In the old days we used the*

*three bin system – one was being used; one waiting to be used and one was being refilled).*

Good inventory is also the strategic buffers that we set up before our bottleneck processes after we have introduced the Theory of Constraints (TOC) which requires a fundamental change in our thinking! We are only interested in the effectiveness (efficiency) of the bottleneck process, not all processes. We learn to plan to load the bottleneck process not the first machine in the sequence and when coupled with flowing components rather than processing in batches, we are able to eliminate much of the bad inventory – work in progress. In conjunction with TOC and flowing materials, we introduce the concept of schedule adherence – only 100% achievement will do – making only the parts we want, when we want them!

*Bad Inventory* – includes excessive raw material purchased and supplied because 'the castings have to be made in large batches' and the stock of hundreds of tonnes of stainless steel bar that a manufacturer purchased as the market price was low – he is still using it six years later. Bad inventory is obsolete materials caused by such examples; components that may never be used, the excessive work in progress caused by manufacturing in batches and making things that the customer 'may' want soon but never orders.

Again, unless an MRP system is well managed and all the parameters are correctly and perfectly set, the MRP system itself can lead to bad inventory being created.

*Negative Inventory* - Imagine! Fast food outlets have fresh deliveries every day and have almost zero inventory at the end of the day. We pay for the product when we purchase it but they probably pay for the goods that they have sold and we have eaten today, a month later. Perhaps we could say that McDonald's are lean, agile and give a quick response!

## D Lead Times

### ***Long lead times are both a waste and prevent agility***

In the context of this article, I have defined lead times as being the time for a component to be manufactured or an item to be delivered. Cycle time is the period of time from the placing of an order to receiving payment for the goods or services. The manufacturing cycle time is the processing time on a machine.

*Order Processing* – In the last few years, technology has changed very quickly and we have potential to

change our purchasing systems too. Imagine a huge conglomerate with plants all over the world. Each plant has a purchasing department, purchasing both direct and indirect materials and several hundred suppliers.

The traditional purchasing process is shown below based on drawings for a production part being designed with a two dimensional CAD system: -

1. Receive appropriate requisition
2. Obtain drawings and material specifications
3. Copy drawings
4. Copy Material Specifications
5. Write letter / request for quotes
6. Collate letter/ request for quotes / drawings / material specifications
7. Post to several potential suppliers
8. Wait – lead time
9. Receive queries from suppliers
10. Refer to engineering department
11. Reply to query
12. Receive written quotations
13. Analyse quotations
14. Select supplier
15. Place purchase order

Using our current technology for the same component, we could reduce the lead time and waste significantly:-

1. Receive a purchase requisition
2. Post drawing and material specifications and all other details on secure website
3. Email enquiry and passwords to many potential suppliers
4. Hold Competitive Bidding Event (internet auction)
5. Select supplier
6. Place electronic purchase order

For tooling or indirect supplies we can install point of use Automated Tool Dispensers (ATD) where, as a tool is used it electronically reorders its replacement from the supplier. We can eliminate the tool store and get the suppliers to refill the vending machine (ATD).

*Materials supply* - As our customers become to expect Just In Time deliveries from us, we should expect Just In Time deliveries from our suppliers. We should obtain the cost advantages of giving a reasonably long term commitment to our supplier but negotiate several deliveries per week. We could persuade our preferred suppliers to use Kanban systems and also we could reduce the number of our suppliers significantly by using integrators.

Our suppliers need to be lean and agile and as we reduce the number of suppliers and develop 'real' partnerships, we can work with the suppliers to our

mutual benefit by jointly learning and implementing new techniques, together.

*Manufacturing* – the effect of the Theory of Constraints, coupled with flowing components and scheduling bottlenecks will all contribute to reducing manufacturing lead times, significantly.

## E Waste

***Waste elimination is the key to both lean and agile manufacturing.***

In the discussions about the strengths of our improvement philosophies - Lean, Agile and Quick Response, Six Sigma - we should accept that long lead times are themselves a waste. Long cycle times are also a waste – if we can shorten the cycle time from six months to three days, we can get paid for our services much quicker and we have much less material around us.

To eliminate waste at all levels within our business we need to understand where we add value – Value Stream Mapping is a superb technique for identifying waste in our processes. Having identified the areas of waste, we can then implement the appropriate lean technique and begin to eliminate it.

Being lean and eliminating waste can apply to every business – whether it is manufacturing metal components, processing patients in hospitals, or delivering goods to a supermarket.

## F Quality

***Six-Sigma means 3.4 parts per million rejects***

In every type of business and in all our improvement philosophies, it is vital that we have excellent quality. Scrap and reject components are a waste – we expend time and effort producing parts which we throw away. We replace the material at a cost and use up capacity on our process equipment to replace the part. Many companies do not realise the real cost of poor quality – what you actually see is just the tip of the iceberg.

The implementation of a flow system reduces the likelihood of there being many components scrapped for the same error at once and simple disciplines such as making operators responsible for their own quality and ensuring components are correct before the next operation is carried out, assist in increasing quality standards.

Formal quality systems such as ISO 9000 or QS 9000 (in the automotive businesses) are business, not quality, systems. They require that the whole business operates to procedures and to standards.

QS 9000 itself requires that opportunities for quality and productivity improvements are implemented to eliminate waste and recommends various continuous improvement techniques including Theory of Constraints.

The philosophy of Six-Sigma takes a company from being 'good' to being 'world class'. The philosophy is based on a major culture change within the business and extensive statistical and problem solving training for most employees. However the goal is simple – understand what we are doing, measure it, and improve it.

## G Delivery

### ***Schedule Adherence is a key to on time deliveries***

Schedule Adherence is another simple concept! If the schedule requires us to make 50 parts by 10.00 a.m., we make 50 parts by 10.00 a.m. If we make 52 parts we have made two pieces of bad inventory. Similarly, if we only make 45 parts we have only achieved 90% schedule adherence. If parts X and Y are assembled together with other components and we only manufacture 90% of X and 90% of Y, then there is a high possibility that we can only assemble 81% of what the customer requires. Schedule Adherence requires us to know what everybody is doing and to plan our production correctly.

*On Time Deliver from Suppliers* – we should monitor our supplier's schedule adherence against the schedules that we issue, but we should make sure that the schedules are valid. Only too often, customers 'with good MRP systems' issue schedules with arrears on them – even when the supplier did not know that the component was required! Pull systems and flowing work will again help our suppliers to achieve on time delivery.

*On Time Delivery to Customers* – as with our suppliers, the same demands apply to us supplying our customers! But we must avoid waste when we are delivering too! In the early 1990's, I visited my employer's Japanese Plant. Their major automotive customer was requiring Just In Time deliveries – four times a day with a timed delivery slot. As a supplier we were achieving 100% on time delivery and were heroes. But the manufacturing plant was still assembling in large batches.

The response to this request for JIT deliveries was to set up a warehouse just outside the customer's plant and we delivered in bulk to the warehouse, which sequenced the parts for the customer. With hindsight, the warehouse and its staff were a complete waste and were in fact making the business less responsive – as we were supplying

from the warehouse we could make even larger batches in the plant and save on changeovers..... We had implemented Just In Time by adding waste.

## H Payments

### ***Cash is king!***

Cash is the key to survival for us, our customers and our suppliers. We need some fresh thinking on our finances.

Several USA based companies have working capital reduction teams – working capital includes inventory, receivables – receiving money from our customers and payables – paying our suppliers. Apart from inventory, the team's goal is to maximise cash in the business – collect the money we are owed as soon as possible and pay the money we owe as late as possible.

In our new world of supplier partnerships, openness, trust and transparency, we need to find solutions that help us all. Perhaps a system using measures that we already have could be employed, where the supplier is financially rewarded for 100% schedule adherence and the customer is financially rewarded for on time, or even early, payments.

A 5% bonus for on time delivery and a 5% discount for on time payments gives us an incentive to be fair! And does not cost either the supplier or the customer anything unless one fails!

### **Implementing the change in philosophy**

Whichever philosophy we feel we should implement - Toyota Production System, Continuous Improvement, Cycle Time Reduction, Kaizen, Lean Manufacturing, Total Quality Management, Six-Sigma, Agile Manufacturing or Quick Response Manufacturing – each requires a change in culture within the business.

This change must be driven from the top down, and whilst the whole management team must be totally committed to the change, one person should drive it. From personal experience it is sometimes difficult to see the 'wood for the trees' and this is where outside help is often necessary. Consultants cannot implement the changes, but based on their previous experiences, they can help, suggest, mentor and train you to achieve your goal. But the goal remains the same:-

***Our customers are expecting us to change. We need to respond quickly to their demands and we need to change our culture to eliminate waste and introduce agility throughout all our business processes.***

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- \* Think outside the box: Utilise continuous improvement to leverage new business opportunities with Norwich Union Life and Kodak Polychrome Graphics
- \* Stop talking and start listening: New techniques to achieve a two-way conversation and leverage support from shop floor to boardroom from Bechtel and Dell
- \* Keep your wheels turning: Create your own constantly changeable continuous improvement programme structure with true-to-life examples from Bombardier and Alstom
- \* Dress to impress with a fitted, tailored toolkit: Achieve true integration with Lean, Scorecards and BPM with North West Wales NHS Trust and Royal & SunAlliance
- \* Lead your leaders and train your trainers: Utilise the examples of Siemens and Motorola to reach higher goals with your internal support structure

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## Jim Womack's January Newsletter

I started my e-letters immediately after the terror attacks of September 11, 2001, as a response to the many commentators asserting that JIT could no longer work due to the risk of disruption in supply chains. They argued that large inventories were needed everywhere along value streams to permit rapid response to chaotic conditions.

I knew that this was a complete misunderstanding of the situation. Counting on finished units and parts lying around at many locations to somehow respond to disruptions in transport links or at key production facilities would be ineffectual as well as harmful to production organizations and society. Hence my first e-letter, "Nonsense About JIT." (I hope you are aware that this and all 50 of my subsequent e-letters are available at [www.lean.org](http://www.lean.org) in the Archives section under the Community tab.)

Since that time I've been keeping a media file on reasons why JIT supposedly can't work in today's world. The latest reason comes from the January 12 *Wall Street Journal* where a front-page article carries the headline "Just-In-Time Inventories Make U.S. Vulnerable to a Pandemic." The key sentence in the article describes the problem as follows: "Most fundamentally, the widely embraced 'just-in-time' business practice – which attempts to cut costs and improve quality by reducing inventory stockpiles and delivering products as needed – is at odds with the logic of 'just in case' that promotes stockpiling drugs, government intervention, and overall preparedness."

So, if anyone was foolish enough to think JIT was a good idea after 9/11, surely they will come to their senses at the prospect of avian flu! Let me take a minute to see if I can set the record straight.

First, what is JIT? It's a simple idea first formulated by Kiichiro Toyoda at Toyota in the late 1930s. Each step in a value stream should pull precisely what it currently needs from the previous step in the value stream. This "pull" should be the signal for the previous step to immediately make new items to exactly replace those just withdrawn. The idea is to replace complex scheduling systems -- depending on centralized accumulation of information and complicated formulae -- with simple, intuitive systems that work much better while dramatically reducing the amount of inventories along a value stream.

Toyota implemented its pull system by means of simple rules. One was that between every step in a

value stream it is critical to accurately calculate **standard inventory**. This is the amount of material that must be in place so that the downstream customer is never disappointed. This inventory consists of three elements: Buffer stock, safety stock, and shipping stock:

**Buffer stock** is goods already finished by a step that are kept on hand to deal with sudden spikes in demand from the downstream customer.

**Safety stock** is finished items or raw materials that are maintained to protect the output of the process if upstream suppliers fail to respond to the pull signal in a timely manner or if the process itself encounters problems (e.g., bad quality, broken equipment).

**Shipping stock** is goods being built up for the next shipment.

A second critical rule is to select one point along a value stream as the pacemaker step and to add additional buffer stock there to deal with normal fluctuations in consumer demand. *This buffer is sized to deal with all reasonable variations in commercial demand, so the customer is never disappointed.* By doing this, every step back upstream from this "pacemaker" can operate smoothly with levelled demand for extended periods. This, of course, is heijunka. When done properly, levelling demand largely eliminates the need for the buffer stocks between each step and reduces total inventories along the value stream dramatically.

So what's the problem and why do commentators keep suggesting that JIT can't work in a chaotic world? The problem is that *severe disruptions driven by geo-political events and natural-biological catastrophes must be dealt with outside the framework of JIT.* Only muddled thinking results when normal commerce and extreme emergencies are combined.

How should these issues be uncoupled? Let's look at a specific issue with avian flu, where a major worry is the shortage of ventilators to help victims breathe until their strength returns. Governments need to make a decision now on just how many spare units -- completed and ready to run -- need to be kept on hand to deal with a sudden, enormous surge in demand. (The *Journal* article states that the U.S. government does have a stockpile of 4,500 but that tens of thousands of additional units may be needed very quickly from an industry that currently produces only a few thousand units per year.)

These goods should be held separate from normal commercial inventories, under government control, and called by their proper name: **Emergency stocks**. These are simply a physical version of an

insurance policy, except that the policy is for society rather than an individual.

Proposing instead that old-fashioned just-in-case inventories located along the ventilator value stream could solve the problem is naïve: The real problem is the lack of capacity to assemble the parts quickly into finished units. And thinking that companies on their own will maintain a buffer stock of finished units adequate for a true emergency is equally naïve. They would go bankrupt if they tried.

(Governments also need to decide how to distribute the emergency stocks when needed, because normal market price allocation can't work in a panic. Looking at the bright side, as the Katrina hurricane emergency showed, modern logistics firms like FedEx and DHL are capable of delivering needed items quickly in chaotic conditions, even when government efforts falter.)

The key point to note is that with emergency stocks in place, as we should all hope they will be, JIT works just fine. It helps production systems deal with "normal" variations in commercial demand at the lowest cost with the highest quality with maximum responsiveness to the customer's desire. Indeed, the cost savings from JIT -- which we've only started to achieve across the entire economy -- are a good way for society to afford the cost of emergency stocks.

So, please, whenever you hear well-intentioned but muddle-headed people attacking JIT when they really should be confronting our lack of emergency stocks, do what you can to set the record straight.

## GM gets that 'oh, what a sinking feeling'

*This article appeared in the LLEAN Newsletter, written and edited by Gary Kerr, a Lean leader in Australia. Deborah Cameron wrote the article. It outlines GM's increasing problem in dealing with Toyota.*

Toyota appears unstoppable as it closes on GM's 73-year status as world No.1, but the Japanese giant is taking it quietly, writes Deborah Cameron.

CHEQUERED flags don't come much bigger than this. In the home straight are the world's two biggest car companies, one with its engine wheezing and the other in high gear and humming along. Sometime soon, probably early this year, it will be time for a grand prix-style champagne shower. In first place as the world's biggest carmaker will be Toyota. Relegated to second will be the US motor industry behemoth, General Motors, which has been ranked No.1 since 1931.

Losing its status as the world's top carmaker tops off a bad run for GM. **Behind on innovation,**

sheer wealth (Toyota's net profit in 2004 was ¥1.17 trillion) and management style has given it almost

**facing declining market share, experiencing falling production and unprecedented liabilities for workers' health insurance, the company has started selling assets.** On a circuit made slippery by oil prices and the demand for fuel-efficient cars, GM has fallen behind. Already the industry tachometer is twitching: 9 million units is the magic number. Once Toyota has made that many cars and trucks, it can claim domination of the world's motor vehicle market.

unstoppable momentum, industry analysts including Mr. Mellor say.

In fact, Toyota manufactures close to 9.12 million in 2005 while GM's output dropped. "Toyota's going to be No.1," US automotive analyst Maryann Keller told the Detroit News last month. "And whether they do it under the radar or by announcing it, it's going to happen," she said, alluding to Toyota's fears that publicly claiming the prize will trigger a damaging wave of Japan-bashing in the US.

The company, as a slew of management books testify, has **gained on competitors by paying constant attention to customers and efficiency.** It relies on ideas and improvements recommended by its own experienced managers and workers — not on the PowerPoint tyranny of management consultants brought in on a steep fee and an even steeper learning curve.

"It's a global village now and I don't think it matters which company is No.1," counters the motor industry consultant and online publisher of GoAuto, Mr. John Mellor, from his Melbourne office.

When Harvard Business School professor Steven Spear studied the company, he worked at its plants and reported that managers were expected to spend a minimum of 20% of their time figuring out how to sharpen up processes and implementing the improvements. Management humility was also part of the recipe. "In short: don't spend time trying to outsmart the workers, the machines, or the process," Professor Spear wrote in a draft working paper that summarized the Toyota ethic. "Get right to work experimenting so that they can show you what's wrong, both with the process and with your attempt to improve it." But in the motor industry, image also matters. Apart from its US campaign about job creation, Toyota has published newspaper advertisements that promise investment and prosperity in rural America. They feature a billboard saying "Future Home of Toyota Motor Manufacturing" set against a backdrop of bare paddocks. And it has won friends.

"Toyota is now a major manufacturer in the US as well, so therefore who owns the company isn't all that relevant unless you are a nationalist."

But it is a sensitive point. In the US, where backlashes from agitated consumers and congressmen with protectionist leanings are not at all rare, Toyota has had to tread carefully.

The last thing Toyota wants is a repeat of the reaction a couple of decades ago when Japanese-made cars and appliances were smashed in symbolic protest. Back then, Americans were aggravated by Japan's threat as it stomped Godzilla-like over the landscape, picking up companies, hauling in iconic real estate and throwing millions around in the art market.

In a pre-emptive move against the day that GM eats its dust, Toyota has launched a television campaign with a positive message about how it has created 190,000 jobs in America. With the campaign, Toyota was highlighting "its long-term commitment to the US market", said the senior vice-president of Toyota Motor North America, Dennis Cuneo. Much of the company's manufacturing effort is now concentrated outside Japan. Of the company's 66 car plants and parts factories, 51 are oceans away from Toyota headquarters in Nagoya. 21 of them have opened since 1998 and two more, one in Texas and the other in Guangzhou, are to start up next year. By contrast, it is seven years since Toyota opened a new factory in Japan. This year, more than half of Toyota's vehicles will be from factories outside Japan, including 100,000 from Altona in Victoria, which employs 4700 people.

Toyota now behaves like a company in damage control when, really, it is in the ascendancy. There is almost never any negative news. Last week the Japan Automobile Dealers Association announced that seven out of the 10 best-selling new cars in Japan last month were Toyotas. In September, as petrol prices hit \$1.40 and more, the Federal Chamber of Automotive Industry in Australia said that the four-cylinder Toyota Corolla had become the nation's top-selling car, outselling the larger Commodore.

By decentralizing its management and manufacturing plants, the company has spread business risk and simultaneously changed its stripes from international giant to local player. Its

To top it off, in that same month, Japan's Emperor Akihito ordered new Toyotas to replace the palace

Nissan fleet, causing a surge of delight at company headquarters with the royal seal of approval. But at

the same time as Toyota are making gains among blue bloods; it is also selling to rednecks. Call it diversification or schizophrenia, but the Toyota product range is at least a study in contrasts.

In the rural US, where the pick-up truck is king, Toyota's flag has never flown higher. Sales are up and strong orders are one of the reasons for GM's depressed performance. Yes, Toyota has built a reputation for fuel efficiency with its Corolla and broken new ground with its futuristic hybrid, the Prius, but at the same time it has sold ever more thirsty Landcruisers, and petrol-hungry road hogs such as the Tundra, an oversized V8 or V6 utility. It was this venture into the US pick-up truck market, traditionally GM strength, and the fact that the US carmaker was asleep, that handed Toyota its chance at automotive history.

**GM is acting relaxed. Earlier this year its chairman, Rick Wagoner, said that the company had been ahead for 73 years in a row and that he'd bet that it would be ahead for the next 73. But among industry watchers, the smart money is on Toyota.**

"In some of these car companies, it is like everyone is rowing in a different direction and it takes someone to get them to face the same way and row at the same time," Mr. Mellor said.

"I don't think GM management is there. Perhaps they haven't looked far enough into the abyss. " Not for much longer.