

A New Business Model for the Global Economy

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1. Introduction.

To compete in the global marketplace the new rules of business need to be understood and all existing business models need to be substantially modified. This applies to all the functions of the business, marketing and sales, operations including supply, manufacturing and purchasing, innovation and R&D, finance and control and the way we use our people both intellectually and physically. It has been said "luck is preparation meeting opportunity".

Albert Einstein once said that:

"Imagination plus knowledge equals achievement" or again "Logic takes you from A to B, but imagination takes you anywhere"

Well the opportunities are there, we have the natural resources and a strong innovative and competitive spirit, now is the time to show imagination and build for export for the future.

The western world is struggling to compete with the low cost production from China in particular and the clever innovative process innovation of Japan. Toyota and Honda have pushed the USA giants GM and Ford to the brink of bankruptcy. It was once said that what is good for GM is good for America. Well the converse also applies. The question must now be why are GM and Ford in so much trouble if they have been practising Lean and SPC for at least 15Years?? What about TQM??

2. Background and History.

In 1990, the USA commissioned a study of the world automobile industry, (1). The USA believed it had the answer, Lean Manufacturing. It was noticed that in all the plants in Japan that there was a significant difference in the amount of inventory compared with US and European plants.

The Japanese plants looked "Lean".

My own plant experience and training in Japan has shown that there is much more to it than that. Womack, Jones and Roos (1) missed three very important points, process innovation and the clever and effective use of digital information(16,17), and the supplier connection. Much of this has now been documented in "The Second Century" (2) and applied in Melbourne with great success (3).

Many investigators have not noticed the strong connection between new product development and process innovation in Japanese plants. In particular German experts who have visited Australia as guests of the Australian Graduate School of Engineering Innovation when I was fellow at this three University initiative, have not seen the connection.

When I was approached by the owners of Shaw Australia (Shaw USA, now owned by Warren Buffet), in 1999, my plan was to remove approx \$40M from working capital as soon as possible. It was clear after an audit, that techniques such as Lean Manufacturing using Six Sigma, 5S and value stream mapping would be too slow and time consuming, although valuable. It was decided instead to measure the agility and flexibility of the plant, remove the forecast and match processes in the smallest economic batch quantities, and make to order whilst matching as much as possible, the manufacturing capability of the plant to the demand variation.

The result was, after 2.5 years, \$40M capital was removed from the balance sheet. Finished goods stock and waste in the distribution centre was cut by approx \$10M and \$2M respectively, and on time deliveries were improved from 32% to 98%, and later 99%. A six week strike called by the TCF Union demanding an increase in wages when the workers were already paid above the award and above the competition, was weathered successfully and all people were very happy. All the creditors remained happy. The date was January 2003.

The assignment was completed so successfully that the profit EBITDA improved from a loss of \$0.5M to a profit of \$40M and much of the IP generated was sent back to the USA. The profitable run continued for the next 2 years until the management team, (no longer under my control since my contract terminated in early 2003), introduced a new product range that the marketing department claimed had to be in stock if they were going to sell it. They broke the cardinal rule. The product did not sell and the profit slumped from \$40M to \$20M and the share market reacted angrily (4). This resulted in the CEO and many senior managers having their employment terminated (4). The reason given for the

termination of the contract was that we can now carry on and no longer need to innovate???

The Chairman has since returned the company to some of the new rules of good digital manufacture but the damage has been enormous (13).

None of this should have happened.

So what is it that escapes most Managers?

Firstly they stridently stick to an MRP system that relies on a forecast. Forecasts will always be in error.

The error will be accentuated by longer extrapolation, longer planning cycles, larger plans, and inflexible manufacturing equipment plant and a large product range.

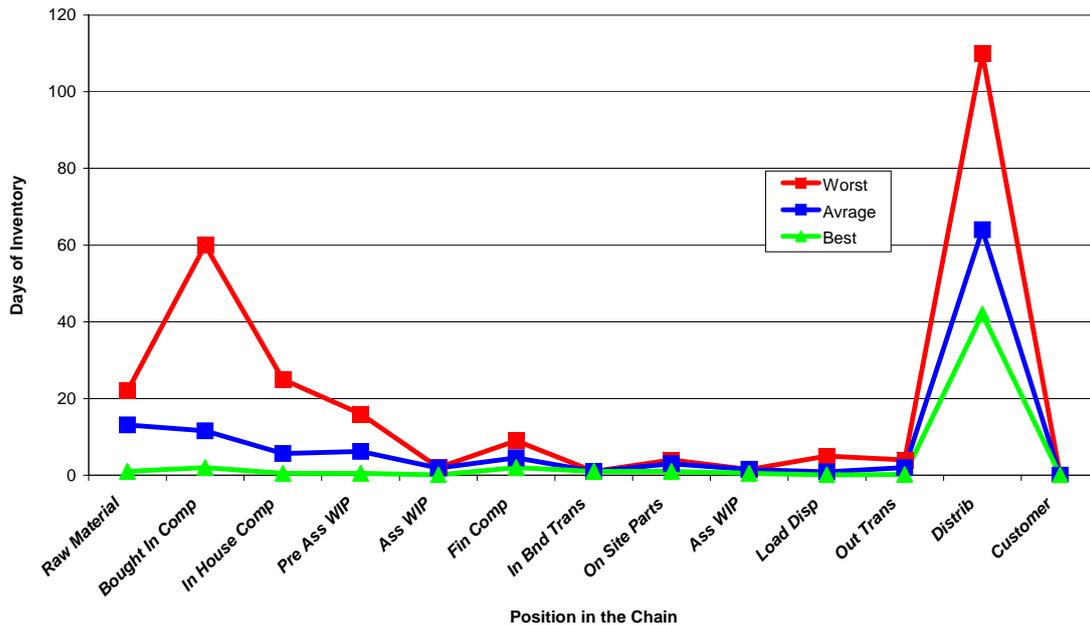
A model has been developed and used successfully to overcome these problems, and has been presented in principle at the SAIE conference in Melbourne (6). To eliminate the problems inherent in poor forecasting where from my own experience the errors are usually plus or minus 30% to 50%, even in Class "A" MRP plants, This means either overproduction or lost sales or too much inventory and waste. A pull system needs to be introduced on a short time interval consistent with plant flexibility (5,6,7, 8, 9, 10). 25 Rules need to be applied (10) and the nexus with class A MRP broken.

3. A Pull System Over-riding the MRP System

Manufacturers can no longer see themselves as a simple entity linked loosely to suppliers and customers. Holweg and Pil (11,12), have demonstrated this quite clearly as illustrated in figure 1 below which is a reproduction of their data.

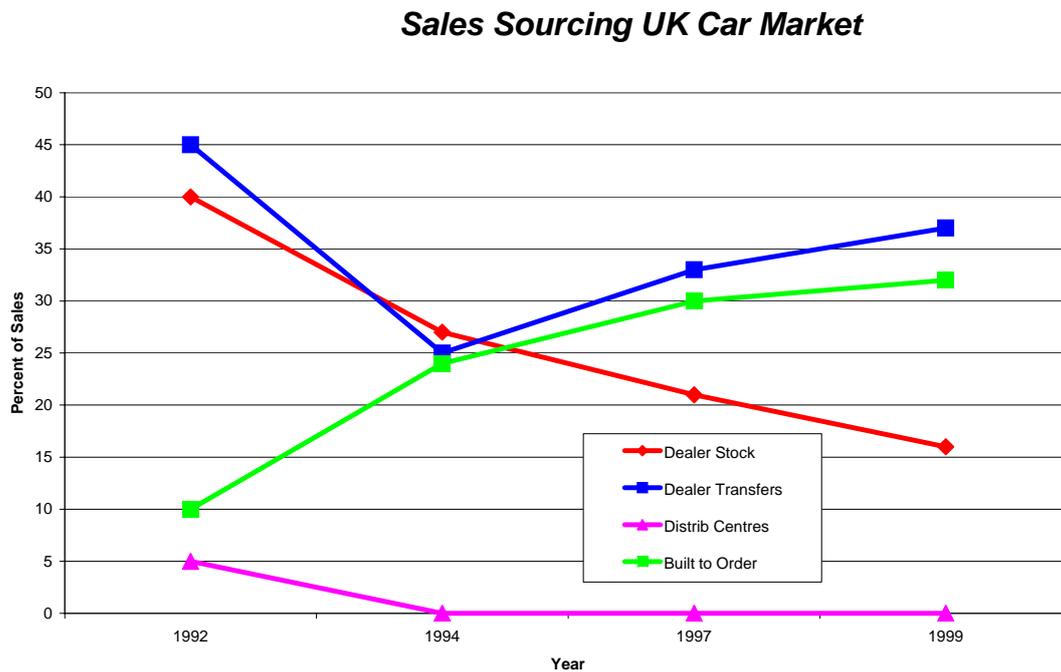
Figure 1 Inventory Profile in the Supply Chain from Raw Material to the final Automobile distributor.

Inventory Profile in the Supply Chain



It is clear from this figure that the only part of the supply chain which is Lean is the assembly area and one could argue that this is the case only because the finished cars have been pushed to the distributor. The lowest inventories were recorded for the Japanese manufacturers, particularly Honda and Toyota, and the highest were the US manufacturers with most of the European manufacturers in between. The supply chain is not Lean and the processes of JIT assembly have simply pushed inventory out each way. This data must be looked at in conjunction with the following data in Figure 2, again from Holweg and Pil (2,11,12)

Figure 2 Sales Sourcing in the UK Market



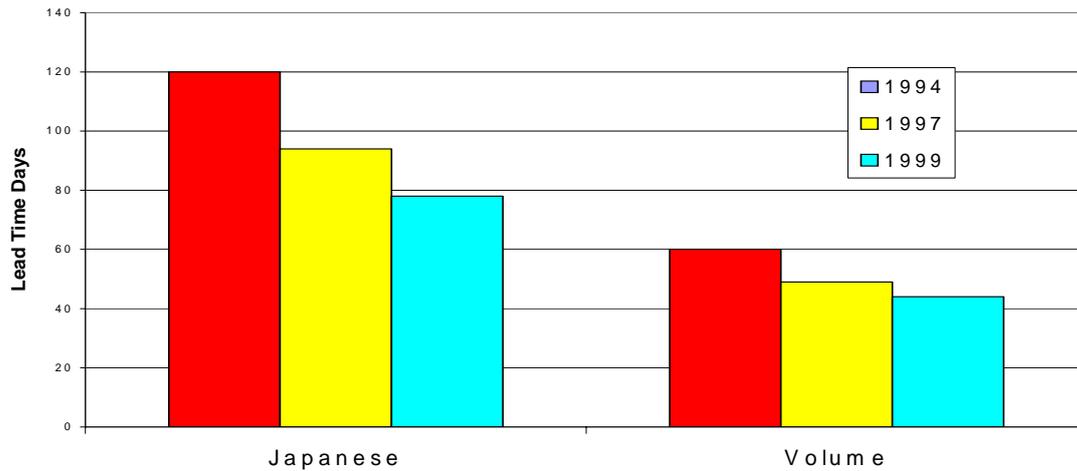
From the data in figure 2, it is the intention of all manufacturers is to source Build to Order as much as possible. While this means that the customer may have to wait for delivery it also means that the permutations of the model can be extended. In the graph below both the BTO and dealer transfers are increasing and sales from dealer stock are in decline. It all points to the goal of Toyota to supply a car built to the customer specification within reasonable limits, in 10 days say from a factory in Japan to a Japanese customer in Japan.

Distribution Centres are to become an inventory point of the past.

With the reduction in inventory and move to Build to Order, the delivery times have increased as shown below. However this is probably only a temporary aberration. This is illustrated in Figure 3.

Figure 3 Auto Delivery Times (Order to Delivery)

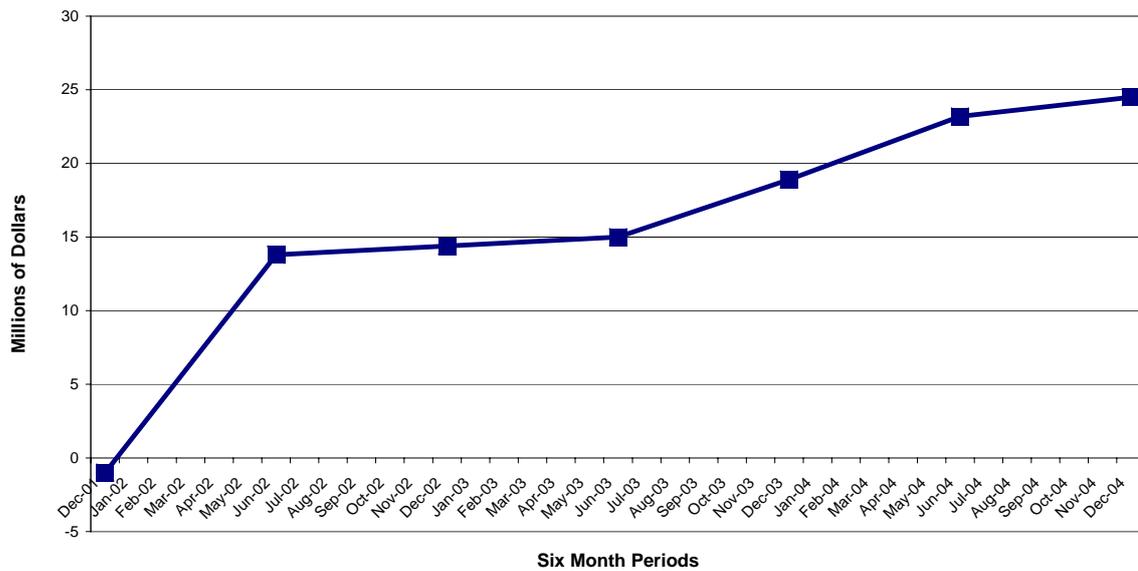
Auto Delivery Times (Order to Delivery)



Applying this general principle to a Made to Stock Business like a carpet manufacturer or a manufacturer of FMCG (Fast Moving Consumer Goods) like say Reckitt Benckiser or perhaps a paper manufacturer like Kimberly- Clark, could possibly result in similar profitability improvements as was achieved at Shaw (Feltex) in the period 200 to early 2003, as shown in Figure 4 below. So, to avoid mis-interpretation of this concept, the customer requested lead- time must be established (CRLT). Much of this will be in the transit time to the customer. It is impossible to make every product every day in a batch size of one, but it is possible to match the CRLT with the measured agility of the plant and equipment and mix the product range as MTO (made to Order) and MTS(Made to Stock) to deliver 100% on time to the CRLT with minimum working capital in inventory if the planning cycle is adjusted accordingly and the correct algorithms are inserted into the planning cycle. This is all despite the fact that the production lead time (P) will always be greater than the demand lead time (D). ie $(P/D) > 1$. After this is achieved, the planning cycle demand can be linked digitally to the customer and consumer demand. The implementation model can follow the one documented in "The Quality Solution" (14).

Figure 4. Shaw (Australia), (Feltex Australasia), EBITDA from 2002 to 2004 at 6 Month reporting intervals (3,4).

Shaw / Feltex EBITDA



The success and speed of the pull model without improving the inherent flexibility of the machines or conducting value stream mapping or applying six sigma or 5S is very evident. Further gains can be made with these Lean tools but the time interval is greater than may be desirable for the effect to take place. At Shaw/Feltex we did not have the privilege of a lot of time to improve the profitability of the company. The program involving the modification of the MRP system was complete in January 2003 and the contract for further improvement was terminated. The profitability continued until January 2005 when the management introduced a new product range and the marketing department insisted on filling the finished goods store with the new range which did not sell. In addition, the manufacture of the new range eroded the production of fast flowing lines and the profitability collapsed in early 2005.

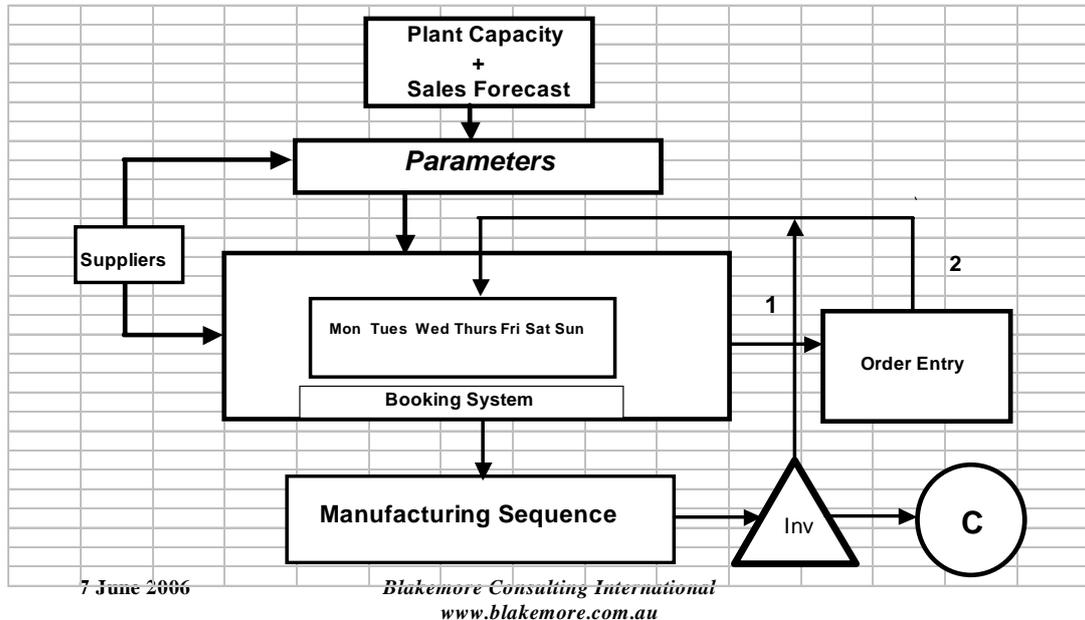
So what is special about this highly successful model?

It is blend of the Toyota Production System and a simple Made to Order System (MTO) and Made To Stock (MTS) system. So, despite the fact that Shaw made 5500 products and the machine flexibility was poor and often involved 10 to 16 different processes, the new planning system cut working capital at he same time as the deliveries on time and profitability improved.

The model, which is only one of the 5 new business models developed (5,6), is given below in Figure 5.

Figure 5. The Pull IT Model modification of the MRP System. The first stage in digitisation.

Pull IT Model



The point of the model is to eliminate the forecast and make by replacement and later fully digitise the planning cycle by digitally linking with customers. The above is only the first stage of the process.

4. Conclusions.

As mentioned this is only one of the business models developed to assist in making one group of manufacturers more competitive in the increasingly competitive global economy. Other models can be seen on the web in principle only, details will follow. (5). The aim is to make Australian Manufacturing more competitive to rescue our Current Account Deficit (CAD) reduce our foreign liabilities which are now at alarmingly high levels (approx 60% of GDP, and this was 25% when Paul Keating made his famous Banana Republic Statement in 1995.) At the manufacturing summit in Melbourne on the 12th of December 2005, Rod Hill of the CSIRO (14) presented clear evidence for the diffusion of R&D funding and the strong correlation between employment and exporting. As our net foreign liabilities grow and the capital flows in to buy our assets we loose control of assets and IP. The economists at the “Sustaining Prosperity Conference” in Melbourne in April 2005 (15), will have a lot to answer for by 2012 or earlier.

5. References

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