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In This Issue

- TOC-Lean Institute Chat
- Lean Issues
- TOC Update
- TOC-Lean Institute News



Links

www.toc-lean.com

is now live – go see for yourself

TOC-Lean Institute Chat

Key developments this month for the Institute comprise the creation of the new web site – check it out at www.toc-lean.com and let us know what you think. We are also hoping to create some new links with partners within the next few months. Washington State University is one of the most prominent universities in the USA and has an enviable record in providing education and training in Lean and TOC.

2007 will see the promotion of workshops in association with another new partner, the I.Mech.E, which is very exciting. This is one of the most prestigious Institutions in the UK and beyond with over 40,000 members in the UK alone.

A core part of the Institute is the library where you can download papers of relevance to the manufacturing and service industries. Now that the web site is up and running, take a look and let us know what you think. We will also have an archive area where past papers and research reports can be found and copies requested. The final aspect of the library is the recommended books section which will cover books of interest in the manufacturing and service world, all with a TOC and Lean perspective, but I am sure that others will sneak in as well!

Finally, I am sure that many people reading the forum newsletter will have stories of their own: if you wish to tell others about your success, or perhaps the pitfalls you have experienced and want to share, then please e-mail me at tedh@toc-lean.com and I will consider your piece for publication. The same applies to writing a response to any of the articles that appear in the forum. I should point out that there is a review group exercising editorial control just to make sure that there is a certain quality of submission.

Lean Issues

Some thoughts on the failure of Lean to take root?

Written by Ted Hutchin with a major contribution from Enrique Rey a fellow member of the Goldratt Implementation Group (GIG) Europe from Spain.

20th June 2006

Consider the following statements which were taken from an interview with myself and a journalist who was looking at the problems being faced by people trying to implement lean into their organisation:

Brief.

I've (the journalist) been commissioned to write the following feature:

Lean manufacturing has become something of a universal cure for the ills of operating in the global environment. What are your thoughts on this?

This is true but hides a number of issues. The first is that Lean on its own is a necessary but insufficient condition for achieving any form of success, which also suggests that success has been properly defined. So let me suggest that success here means an improved bottom-line performance in terms of both financial and non-financial measurements. The financial measurements are profit, ROI and cash flow, the non-financial are due date performance, lead time reduction, inventory turns and defects. I would expect to see DDP to be 100% with zero defect as a given and the lead time being reduced whilst maintaining the excellent delivery and quality performance. I would also want to see the ability to respond quickly to changes in demand and the ability to cope with urgent demand from key customers.

Cutting waste is acknowledged as the best method for increasing efficiency, profitability and competitiveness and for fending off the migration of production to low cost economies; do you agree with this statement?

Before we can go any further we have to define waste. Is a machine standing idle waste? Not necessarily. Is a machine working at 100% utilisation correct? Again not necessarily. If the machine is a non-constraint then it must not work at anything above that required for the constraint, assuming it is feeding the constraint. If it is fed by the constraint then it will only ever consume what the constraint has produced. To keep a non-constraint working at 100% is waste – but the usual measurement system within most manufacturing plants will not recognise this.

I do not accept that simply cutting waste is the best method for improving overall performance, there are other factors that must be taken into account; it is far too simplistic to say that waste alone will deliver this.

The problem lies in the desire to increase efficiency which is a complete waste of time as it cannot be achieved - due to the second law of thermodynamics! (See below). No manufacturing company should chase efficiency; rather it should focus on the global performance of the chain as a whole and ignore local optima measurements. If this is done then there is every chance that profitability and competitiveness will increase substantially.

Also remember that labour cost is fixed in most cases and fits into the category of operating expense. It should not be factored into product cost, indeed product cost does not exist either and should not be used under any circumstances – it will only lead to the wrong decisions being taken.

Traditional management is based on one fundamental assumption: the same concept, efficiency, can be applied in the same way to a productive system, let's say the global efficiency, and to individual resources, let's say, local efficiencies. In both cases, efficiency is a relation output-input, let's say output/input. Output and input during how long? It doesn't matter, during any period of time.

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Why do we, my colleague Enrique Rey and myself, claim that this is a fundamental paradigm? For two reasons:

- Efficiency is the main driver of management policies.
- This measurement is the cause of the core generic and chronic problem of management.

The core problem of management is that local optima are not aligned with global optimum. It is a core problem because a vast majority of problems are effects of this core problem. Look at the objectives in different areas of Business Units: more volume of sales, purchasing cheaper, more tons per day, more pieces per hour, less inventory, reduce cost, reduce lead time, more projects in the pipeline, larger batch sizes, shorter batch sizes all of them are local optima. By the way, it is not so difficult to check that each one of these objectives conflicts with some other. For example, more volume of sales may conflict, and many times *does* conflict, with the profitability of the sales. Local optima are the cause of inter-functional conflicts. Local objectives in conflict are necessarily in conflict also with the global optimum.

Thus, in real life, what is the connection between the efficiency of the system and the efficiencies of individual resources? Simply, no such connection exists. The presumption that increasing local efficiencies is the way to increase global efficiency is fully inconsistent with real life, and ignores the rules of Physics. Pointing to this fundamental flaw of traditional management is the great merit of the Theory Of Constraints (TOC). TOC is the only approach that really challenges a deep paradigm, the foundations of traditional management.

But many have found that making lean stick is not so simple, any ideas why that might be the case?

This is simply because the dominant measurement system (Cost Accounting for making decisions) forces the wrong response within the plant for day to day management. Lean is in conflict with the current measurements systems, but does not challenge them as the Theory of Constraints does. This is part of the reason why TOC in combination with Lean works so well: TOC deals with the measurement issues, and then Lean can be used to improve the process in line with what TOC is saying about the current flow through the plant. Once the erroneous measures are removed life is so much easier – but removing these measures is the hard part. Of course many companies have done so and have then gone on to make real money, but they still had to work hard at measurement change first.

When the lean process falters and the workforce returns to old habits, what has gone wrong?

Between 1993 till 1996 I spent three years at Cranfield completing my PhD which examined the issues preventing successful implementation of the Theory of Constraints. The results also apply to Lean.

In every industry there is a powerful set of rules and procedures that dominate all activity; in this case we are looking at the application of cost accounting within the measurement system to enable decisions to be made. Let this be clear, this is not an attack on cost accounting, which is a key reporting tool and is a mandatory requirement in the USA and the UK. It is not mandatory to use cost

accounting for making decisions, however - yet this is the mistake that most people make. A far better approach is the use of Throughput Accounting for making decisions, and this time there is every chance that both Lean and the Theory of Constraints will deliver big time!

I call the force that maintains the status quo **Paradigm Lock** (see Unconstrained Organisations published by Thomas Telford). It was discovered through a rigorous analysis of the case studies examined as part of my research (over 300 people in 13 companies drawn from the UK, the USA and Europe).

But there is another reason for this failure: the measurement system that focuses on efficiencies ignores a third variable that affects all manufacturing plants – the response time of the system, the time the system takes in producing output from input. Many problems have to do with service to clients, too long response times, poor due date performance and so on. And it happens that this third variable, response time, is not “mixable” with the other two. As input and output are dimensionally homogenous, there is no problem in combining them into one parameter, efficiency, global efficiency.

These two variables are not independent: there is a trade off between them, it is impossible to improve unlimitedly the one without damaging the other. This trade off is much more generic than just productive systems, it is a universal physical law: if you want to drive faster or if you want a more powerful air conditioning system, you must pay for more power. In management, if you want to respond to your clients faster and faster, you will end up having to pay for the shorter response time with less efficiency, and with more cost. Power has a price. You end up having to choose between more efficiency and less response time. This trade off is what provides the managers with two degrees of freedom, so that we have some decisions to make.

Curiously enough, so long after the announcement of the second principle of Thermodynamics, management “science” still ignores such a fundamental law, as if productive systems were out of the realm of the physical world. Have you heard about the cost of producing faster? What portion of the product cost has to do with response time? Don’t look for it, Cost Accounting still ignores response time.

The nature of the paradigm lock facing manufacturing industry is not too difficult to determine, and the same is also being applied to the Health Service, to schools, the Police and many other organisations – and all based on erroneous assumptions about cost and the allocation of cost and the ability of the system to respond.

By talking to manufacturers who have experienced this problem we will see what has to be done to get back on track and ensure the company remains wedded to its lean drive, which means just being more focused, putting more effort in will be sufficient – do you agree?

This is probably a forlorn hope as they do not have the necessary analytical skills to delve behind the obvious and understand the real changes that are necessary to make performance improvement reality on into the future i.e. sustainable. They are captured in the dominant paradigm which is driven by investment people through the stock market, by banks, by accountants, indeed all the people who don’t really understand dependent events and statistical fluctuations – which is what a manufacturing company is governed by.

If a company really wants to implement lean then it has to change the way it approaches the whole question of change. This means focusing on those very few areas that have the most impact on overall performance – the constraint. This is also the area where the investment in change has the most ability to work and drive the performance straight to the bottom-line – which is what the goal of the organisation is in the first place. More effort in the wrong place does not work, being focused without the right tools does not work, it requires the ability to understand what is holding the company back today, answering that question, dealing with it, then going round the loop again and again – what in the TOC world is known as the Five Steps of Focusing. Doing Lean this way makes a substantial difference to the performance of the organisation, and always in the right direction.

TOC Update

The application of TOC has been seen to deliver bottom-line results to many different companies around the world. The driver for this phenomenon is the book written by Dr Eli Goldratt and read by over 3,000,000 people – ***The Goal***. So what makes this book so different? Well, this is how the TOC group in Australia, ViAGO, described it:

1. It's a novel, not a textbook

- ***The Goal*** is a story about a manager who is given only 3 months to turn his factory around
- It is easy to read, and fast paced

2. You will identify with the characters in the story

- You will find yourself relating strongly to the characters; you will see yourself, and your colleagues, in the story

3. You can generate business results, quickly

- Many companies report significant gains, operational and financial, just from having the management team read, discuss and try the ideas used in the novel

4. You CAN do it - it is REAL, not THEORY

- Thousands of companies have implemented the concepts, straight from the book
- Over seven thousand copies have been sold in Australia and New Zealand in the past few years – and hundreds of those companies have reported results back to us

5. It's an implementation guide

- ***The Goal*** is a required text for several courses at 5 universities in Australia and NZ. Translated into 27 languages, it is also taught at more than 200 colleges and universities overseas
- It tells the story of HOW to implement constraint management properly – written by the inventor himself

6. It's well established, and it's up to date

- The first edition of ***The Goal*** was written in 1982; since then the book has been rewritten twice, to keep it up to date with the current state of constraint management thinking

7. You can get more information, if needed

- There are 2 sequels to the novel + a movie version
- Over 80 textbooks are available

If you want a copy let us know at the Institute, we can supply copies to you, or alternatively try Amazon. You might also like to look at our **Goal Breakfast** and watch the video followed by bacon bap and a mug of tea or coffee – see the web site for details.

TOC-Lean Institute news

News from one of our partners: Realization, a US company that promotes Concerto, one of the best practice **Critical Chain Project Management** software products.

2006 Franz Edelman award goes to WR-ALC

Realization's Customer Wins Prestigious Award for Results Achieved by Implementing Critical Chain Execution Management system.

SILICON VALLEY - May 8, 2006 - ROBINS AIR FORCE BASE, Ga.

The Institute for Operations Research and the Management Sciences (INFORMS) announced May 1 that Warner Robins Air Logistics Center (WR-ALC) has won the 2006 Franz Edelman Award for Achievement in Operations Research (O.R.) for its entry "Streamlining Aircraft Repair and Overhaul at Warner Robins Air Logistics Center."

The culmination of a rigorous competition referred to as the "Super Bowl of O.R.," the Franz Edelman Award brings together the very best examples of innovation in the discipline from large and small, for-profit and non-profit, corporate and governmental organizations around the world. Past winners in the 35-year history of the Franz Edelman competition have included GM, Motorola, Continental Airlines, the New Haven Health Department and the City of San Francisco Police Department.

The 2006 Franz Edelman Award winning entry was presented by Ken Percell and Bill Best of WR-ALC, Prof. Mandyam Srinivasan of the University of Tennessee, College of Business Administration and Sridharan Chandrasekaran, Vice President of Strategic Services for software provider Realization Technologies, Inc. The winning entry discussed how WR-ALC used Operations Research in 2005 to arrive at a radically different approach to manage the repair and overhaul activity on its C-5 transport aircraft. WR-ALC used an O.R. technique called **Critical Chain** to reduce the number of C-5 aircraft undergoing repair and overhaul in the depot from thirteen to seven in just eight months. The time required to repair and overhaul the C-5 aircraft was reduced by 33 percent. The five additional aircraft now in operation have generated immediate additional revenue of at least \$49.8 million per year. The replacement value for these aircraft is estimated at \$2.37 billion. The additional workload the centre is accommodating will bring in additional revenue of \$119 million through 2008, with this number projected to increase to \$248 million by 2009. In accepting the award, Ken Percell, the executive director and senior civilian at WR-ALC stated: "Warner Robins is extremely pleased to receive the Franz Edelman Award for our work on reducing flow days for the C-5 aircraft line. The results underscore the gains that a proper application of these tools can offer to the Air Force. This accomplishment should reinvigorate the use of Operations Research in the Air Force and across all branches of the military in general."

"To be recognized by the business and academic communities for improvements we've made at this centre, especially with aircraft

maintenance operations, is quite an honour," said Bill Best, deputy director of the 402nd Aircraft Maintenance Support Group. "This is what happens when the most capable people use the most innovative and advanced tools for this highly complex operation."

Critical Chain Project Management is a means of using resources in the most expeditious way possible. The adoption of CCPM has allowed major reductions in flow days. It makes use of the Concerto computer software, which gives a visual depiction of the aircraft, tasks, and status. The lists of tasks are colour coded as to urgency, alerting us to the most important things to do.

"On behalf of the entire C-5 enterprise, we are thrilled to win the 2006 Franz Edelman Award for Achievement in Operations Research and the Management Sciences," said Colonel David Holcomb, C-5 system program manager. "The use of critical chain project management to reduce the time required for depot maintenance is a key element of our plan to increase aircraft availability. The 402nd Maintenance Wing at Warner Robins has executed CCPM brilliantly, resulting in additional C-5 aircraft available to accomplish our Rapid Global Mobility mission. This initiative has provided our Mobility Air Forces with five additional aircraft to provide inter-theatre airlift support to our troops around the world. The team's outstanding contribution to our nation's security warrants this prestigious award."

The other finalists were Animal Health Institute and Cox Associates; The US Commercial Aviation Partnership, comprising Airports Council International - North America, Air Transport Association, Department of Homeland Security, Department of Transportation, The Boeing Company, and the Transportation Security Administration; Omya Hustadmarmor and More Research/ Molde University College, and Travelocity and Sabre Holdings.

The Institute for Operations Research and the Management Sciences is an international scientific society with 10,000 members, including Nobel Prize laureates, dedicated to applying scientific methods to help improve decision-making, management, and operations. Members of INFORMS work in business, government, and academia. They are represented in fields as diverse as airlines, health care, law enforcement, the military, financial engineering, and telecommunications.

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