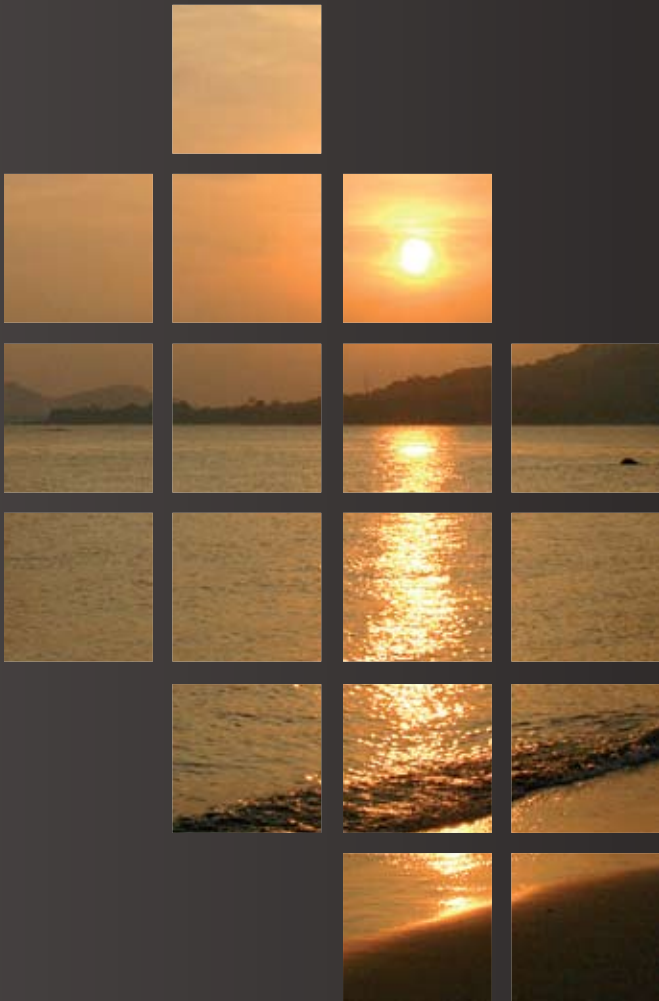
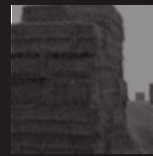
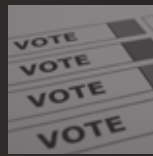
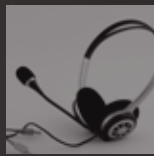


A new dawn

Illuminating lean thought and leading the assault on silo thinking for the benefit of practitioners, consultants and academics alike.



Also this issue:



Staying Lean

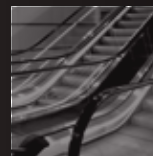
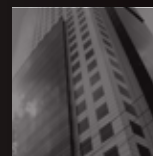
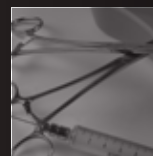
Clarifying the way forward for those already advanced along the lean road. Identifying the crisis points and how to battle through.

Construction with Lean Foundations

Highlighting a new beginning and the approaches being taken by one of the lean communities latest additions.

Reflections on the fabric of the Toyota Production System

Exploring the shift that present-day conceptions of lean have made away from their origins.



The Lean Management Journal is supported by the Lean Enterprise Research Centre at Cardiff University



Dear reader,

Welcome to the first edition of the *Lean Management Journal*, a pioneering new publication which aims to bring you the best and broadest consideration of the advances being made in an increasingly diverse and dynamic lean community.

In this first issue I hope that you find some thought provoking articles to assist you and your organisation on your lean journey. I hope the content will succeed in encouraging a more holistic view of business and industry and in giving greater confidence to look beyond the boundaries of individual sectors for a chance to learn new approaches and gain new perspectives on lean implementation and value.

Our budding publication is nourished by the shared concern of all our editors that continuous improvement and the methods used achieve it should never stagnate or fall into the error of becoming a codified doctrine. Varying environments and demands will make the specifics of all our lean experiences unique. However, it is vital that we maintain the ability to “think outside the box” and to gain insight into our own circumstances by looking to the experience of others; maintaining an awareness of the latest developments in thought and strategy. In doing this it is possible to see new solutions in surmounting our own stumbling blocks and to excel in unforeseen ways.

To sustain this ideal however requires a regular and reliable space where approaches can be considered and compared to one another. The *Lean Management Journal* hopes to provide that space and so, as commissioning editor of the journal I would like to take this opportunity to call readers and leaders of exemplary or exploratory lean programmes (including those known under alternative banners such as agile or continuous improvement) to submit your case studies and become an active part of an expanding lean knowledge pool.

I hope you enjoy this and further issues and I will welcome all feedback and suggestions for improvement or development.

Yours faithfully,

Jane Gray
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In order to receive your monthly copy of the Lean Management Journal kindly email j.gray@sayonemedia.com, telephone 0207 4016033 or write to the address below. Neither the Lean Management Journal or SayOne Media can accept responsibility for omissions or errors.

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Introducing the editors

Articles for LMJ are reviewed and audited by our dedicated editorial board. Here they give readers a brief insight into their conception of lean and the direction in which it is progressing.



Professor Peter Hines Lean Enterprise Research Centre, Cardiff University

I have been working with lean thinking for the last two decades and have recently turned my focus to the following three issues.

1. **How do you spread lean further and further away from its high volume repetitive automotive roots?**
2. **How do you take lean away from a pure shop floor focus to the running of the a whole**

organisation and the associated supply chain?

3. **How do you make the change sustainable from an economic, social and environmental viewpoint?**

I have learned that the critical issue with lean is not the tools, the value stream maps or kaizen events. It is about leadership, strategic alignment, behaviour and engaging people.



Norman Bodek PCS Inc.

Since starting Productivity Inc. Press in 1979 I have visited Japan 72 times. Each person I have met during my discovery of Japanese manufacturing approaches (including Dr. W. Edwards Deming, Dr. Kaoru Ishikawa, Phil Crosby and others) has given me a new perspective on continuous improvement and allowed me to spread their knowledge through publication, masterclasses

and conference events addressing TPS, SMED, CEDAC, 5S, Kaizen Blitz, lean accounting, Kanban, Quick and Easy Kaizen and more.

I founded the Shingo Prize for Operational Excellence at Utah State University with Dr. Vern Buehler and have been one of the privileged few to be awarded personally the Shingo Prize.



John Seddon Vanguard Consulting

I am an occupational psychologist whose concerns about how organisations really worked led me to Deming who stressed the need to design and manage our organisations as systems. Taiichi Ohno did exactly that when he developed the Toyota Production System (TPS).

The TPS is a system, not a set of tools. Ohno would be aghast that his work became labelled "lean"; he insisted we should neither give the TPS a label nor codify method, for it is thinking that is the key. Many in

the "lean" movement have made the mistake of trying to emulate Toyota's success with tools and projects which can only ever gain marginal success at best or, at worst raise costs and damage services. When managers study their systems they learn some counter-intuitive truths – challenges to conventional wisdom. My work has been to develop the methods that allow managers to do this and thereby to achieve results comparable to Toyota's; and in much faster times, for nothing is "made".



Bill Bellows Pratt & Whitney Rocketdyne

For the past 19 years, I have served as an internal consultant for Pratt & Whitney Rocketdyne, California; helping to foster "better thinking about thinking.". My initial role in 1990 as a Taguchi Methods "expert" has transformed over this time frame into a role in refocusing our resource management efforts, from a primary focus on efficiency (doing things faster, better, etc.) to a needed focus on effectiveness (doing the right things).

My interest in effective thinking evolved following my early career a heat transfer engineer when my interest gradually changed from studying the diffusion of heat and mass to the writings of Taguchi and Deming and, eventually, on how to diffuse their wisdom into organizations to foster better team work. My work for this journal will reflect my current thinking on lean, including the limitations of prevailing explanations.



Dr. Keivan Zokaei

Lean Enterprise Research Centre, Cardiff University

I am Fellow of the Lean Enterprise Research Centre and director of an MSc degree in Lean Operations in service industry. My background is in oil & gas industry where I worked both as an engineer and later as a business development manager. My primary interests are lean and systems thinking especially in supply chain management and service improvement.

In continuous improvement the two things I most

enjoy rarely happen at the same time. Firstly, being able to cut across those artificial boundaries in our organisations and focus all improvement efforts on the actual needs of the customers. Secondly, to be able to put thinking back where work is happening; to give the doers the means for learning and improving themselves. I regularly speak at events and write about these topics; but am definitely a student in the school of lean.



Jacob Austad

LeanTeam, Denmark

Since to late 80's I have worked as an internal process development and improvement consultant as well as manager in both public sector, logistics, manufacturing and financial services. In 2002 I became team leader for the first Lean Promotion Office within financial services in Denmark. We managed to reduce lead time from 3-6 month to 15 days by implementing improvement projects based on the lean principles.

Currently I am heading a project development team which is implementing Systems Thinking in the central claims department. My focus and primary approach is inspired by the work of Deming, John Seddon and Peter Hines.

Since 2004 I have translated and published 3 John Bicheno books and recently I finished the translation of Peter Hines' et al Staying Lean and the process of writing my own lean book is progressing.



Wendy Wilson

Warwick Manufacturing Group, University of Warwick

I joined WMG in 1996 as a Senior Teaching Fellow. Prior to this I worked in manufacturing operations for both Toyota and Rolls-Royce, where I gained my MSc in Manufacturing Systems Engineering.

During my time at WMG, I have observed two distinct viewpoints on "lean thinking". The first, and perhaps most widespread, is that lean is concerned with the elimination of waste on the presumption that focusing on tools which lower costs, shorten lead times and reduce defects will create an efficient value stream with high customer value.

The second viewpoint considers that regarding "lean" as a means of improving efficiency alone is very limiting and that value streaming needs to start with the marketplace. There needs to be a rich understanding of who the customers are and what it is they value. This should lead to the creation of value streams designed to deliver the value propositions in the optimal way by employing the principles of flow and full. It is this thinking that underpins WMG's "Principles and Application of Lean" MSc module.



Eby Sanchez

Volvo Group

My lean background has been predominantly been in the development and implementation of lean management practices in the automotive industry. I have 20 years of experience in operational management at the Ford Motor Company before I joined the Volvo group.

My main concerns for the progression of lean centre around the support of cultural change. Management must support kaizen culture at all level and create

"transformation schools" where the culture and behaviours needed for the business environment can be modelled.

I see widespread difficulty for many manufacturing organisation in perceiving the application of lean beyond the manufacturing process. However I believe it is impossible to achieve world-class levels of competitiveness if lean is not also implemented in project development and in supply or purchasing.

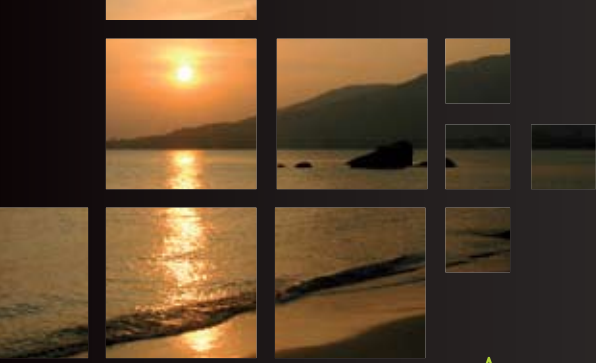


Stuart Barnes

Warwick Manufacturing Group University of Warwick

I am involved in the delivery of MSc and doctorate programmes in the UK and the Far-East and I continue to be research active. Prior to joining Warwick University in 1992, I spent 13 years in industry, including time with NEI Thompson and GKN. WMG was founded on the principle of "excellence with relevance" and I use this combination

of academic and industrial experience to continue in this tradition. Although I am not a lean expert I hope that I will be able to act as a conduit between WMG, our partner organisations and the LMJ in order to help disseminate the latest ideas and dissolve the barriers that hamper collaborative thinking.



Lean practitioners, academics and consultants all share one thing in common – a lack of a decent lean magazine. **Why is this?**

A new dawn, a new magazine

The publishing world, like the rest of us, has traditionally divided itself up into tidy silos. There are magazines about industry sectors, functional specialisms and geographies. These silos are similar to those that we use in industry, professional and trade bodies, governments and academia. If any of you have taken a traditional MBA programme, like me, you will no doubt have taken courses on finance, human resources, operations management and marketing. My own experience was that I learned a lot from such lectures about how other departments think, but little about what I should actually do and how to do it!

That is why I started exploring lean thinking in the late 1980s and why Dan Jones and I set up the Lean Enterprise Research Centre (LERC) in 1994. Today this still represents the largest academic body dedicated to exploring lean thinking in the world. So why do these other magazines somehow not work for me? Well, they tend to go very deep into a narrow silo area without really giving the whole picture of WHAT you need to do, WHY you need to do it and HOW you should go about doing it.

Lean is about understanding what adds value and what does not by understanding the customer. It is about taking everyone in an organisation in the same direction and making the most of your existing talent pool. Within this context, there are a series of unanswered questions that as practitioners and spectators we need to explore:

- **How does lean apply in sectors further and further away from the automotive roots?**
- **What are the key processes that need to be leaned, not just the order fulfilment “value stream” that everyone tends to work on – and then think they have “done” lean?**
- **How does lean work in these other process areas?**
- **How do you consistently engage your employees in your lean journey?**
- **What is there apart from just doing a kaizen blitz?**

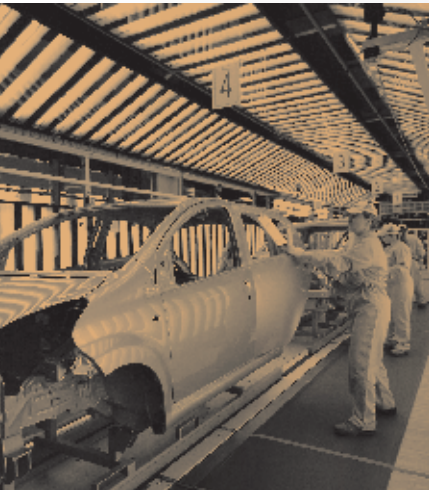
- **How do you deal with and learn from failure?**
- **What do new frontiers in lean thinking – like the lean & green movement sweeping west coast America – mean, and how can we benefit?**
- **Is the accepted wisdom of the Five Lean Principles still right or have things moved on?**
- **How should lean integrate with other approaches such as six sigma and Theory of Constraints?**
- **How do you sustain your changes?**

If you, like me, are keen to know more about these and other key lean questions then read on in this and future editions where all of the above issues and more will be explored. In this first edition my contribution will address the last of these issues in the first of a two part article based on the recent *Staying Lean* book written with my LERC and S A Partners colleagues, Dr Pauline Found, Gary Griffiths and Richard Harrison.

Good reading.

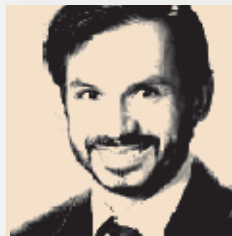


Professor Peter Hines is chairman of the *Lean Enterprise Research Centre* and *S A Partners*. He can be contacted on peterhines@hotmail.com.



Reflections on the fabric of the Toyota Production System

This article offers personal reflections from **Bill Bellows** (Pratt & Whitney Rocketdyne) on the fabric of the legendary Toyota Production System (TPS) and considers the way in which present day explanations of lean have somehow drifted from the original precepts uncovered during early encounters with TPS.



In the late 1960's, Frank Pipp, an assembly plant manager for a Ford Motor Company factory, instructed his staff to purchase competitor's cars. His plan was to have the final assembly team disassemble these cars and learn first hand how they assembled. At that time Ford had a term for those connecting parts in product assembly

which could be assembled without the use of a rubber mallet. This term was "snap fit". To Pipp's amazement, one competitor car purchased proved to be 100 per cent "snap fit"- an unprecedented result that Pipp simply could not credit. He ordered that the experiment on the Toyota pick-up truck be carried out once again and of course, with hindsight, we know the result.

The significance of this discovery was not lost on Pipp but sadly for Ford the "Dearborn people," from Ford's corporate offices, did not share his perception. When they were invited to look over the truck themselves and witness the assembly team's discovery Pipp recorded the following reaction:

Everyone was very quiet, until the division general manager cleared his throat and remarked, "The customer will never notice." And then everyone excitedly nodded assent and exclaimed, "Yeah, yeah, that's right" and they all trotted off happy as clams."

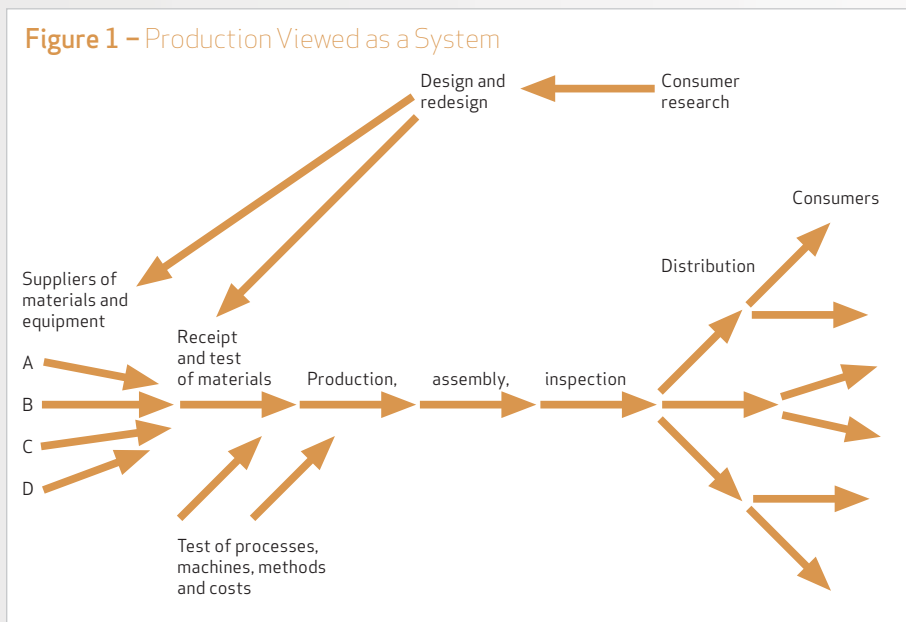
Pipp's documentation of the striking difference in the assembly process within Toyota, by comparison to Ford, was to be found again in the early 1980s when teams from both Ford and General Motors began to routinely visit Toyota's operations in Japan.

One of those to take part in these visits was Ford's Larry Sullivan whose work "Reducing Variability: A New Approach to Quality" (*Quality Progress*, July 1984) aimed to "study quality

systems at a variety of automotive suppliers.” Included in this work are the following remarks:

“The most important thing we learned was that quality in those companies means something different from what it means in the U.S. - that it is in fact a totally different discipline. Over the years, Japanese managers, engineers, and workers have been very successful in reducing manufacturing costs by adopting more enlightened quality thinking and by applying more technical quality methods. In other words, quality in itself has not been the primary motivation in Japan; profit is the main objective and quality (methods) is merely a means to improve profit...Of foremost importance is the new definition of ‘manufacturing’ quality as minimum variation from target.”

With the preceding account by Larry Sullivan as a second reference point, consider what happens when a craftsman works on the design of a product at home, where the customer and producer are often one in the same. The producer-as-customer is quick to judge the product quality and adjust the design-procurement-fabrication-assembly process, as needed, should the resultant product quality fall short of expectations. This system of feedback is much the same as what was explained by W. Edwards Deming to several dozen executives in Japan in 1950. Specifically, he suggested to them that they view “production as a system” and left them with the now famous process diagram below.



As shown in Figure 1, consumer research in this process is essential to providing feedback on the product design to address shortcomings and enable product improvement. Such a viewpoint of gathering consumer feedback is considered vital to organizations seeking to improve product quality. These efforts are often aligned through a non-linear process

improvement cycle that resembles the hand drawn version of this figure, which Deming shared with Japanese executives long before the aforementioned discoveries by Frank Pipp and Larry Sullivan. Years later, in 2005, Dr. Shoichiro Toyoda, chairman and former president (1982-1999) of Toyota, accepted the American Society for Quality’s Deming Medal. In doing so, he offered,

“Every day I think about what he meant to us. Deming is the core of our management.”

The model of a single person engaged in most of the design-procurement-fabrication-assembly tasks helps to highlight how the issue of quality is approached by the Toyota Production System and how it differs from a mass production system. The craftsman model also helps to clarify how Toyota have achieved their leading levels of quality by differentiating between “part” quality and “part of” quality. This theme will be explored further later in this article.

Fast forward now to the mid-to-late 1980s, when a research team at the Massachusetts Institute of Technology, led by Daniel Jones, Daniel Roos, and James Womack, surveyed production systems at 90 automobile assembly plants in 17 countries. Their conclusion was that the results from these plants could be very neatly compiled into three subgroups that fell along geographic lines; Europe, the U.S., and Japan. Coinciding with these categories were the labels “craftsmanship” and “mass production” for Europe and the U.S., respectively. A new term, ‘lean’, was needed to describe the artful blending of craftsmanship, and its attention to detail in relationships, with the speed and low cost of mass production.

These two approaches had previously been assumed to be fundamentally opposed to one another. Before the era of mass production was envisioned craftsmen were relied upon to deliver products of superb quality to those who could afford them. As an alternative to this high quality – high cost model, Honore Blanc, envisioned an alternative production model with drastically reduced costs. Blanc, is given credit for conceiving the production model of “interchangeable parts” as an alternative manufacturing method to craftsmanship; one which could deliver lower-cost products to the masses.

The idea of interchangeable parts was transferred to America by Eli Whitney and soon it became known as the “American method of production”. Long before Henry Ford’s moving assembly line, Whitney was implementing this methodology and his company was the first to be given a contract from the U.S. government, in 1798, for the design and manufacture of a product (a rifle) with interchangeable parts.

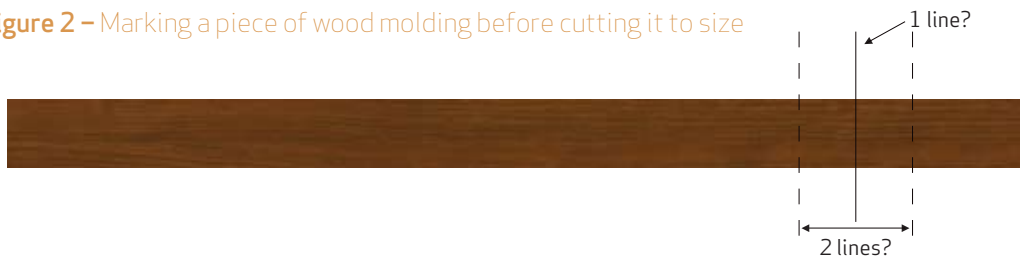
The following extract helps to show how quality levels are perceived by the “do-it-yourself” craftsman and addresses the difference between “part” quality and “part of” quality.

Imagine that a piece of wood molding is needed to replace a damaged length of wood in between two existing pieces. We begin with a piece of molding which is too long and needs to be cut to length. In rapid order, the required length is measured, and the piece is marked for cutting. As a next step, a saw is readied. Consider how many lines one typically would draw across the top face of the wood before making the cut. That is, instead of using short marks to indicate where to place the saw, how many lines would be drawn across the top face to guide the placement of the saw blade during the cut? Most often the solution is to use a single line and subsequently cut close to this line. Why is the habit not two lines, as in the standard industry use of manufacturing tolerances with an acceptable range, in keeping with the practice of interchangeable parts? The “single line” answer implies a belief that there is a “target” length for this piece of molding and indicates a strong intuitive sense of knowing that the piece of wood is “part of” something rather than merely a “part”. A “part of” perspective is likely when engaged in a home improvement project where connections are visible and immediate. In the molding example, the lesser quality of the fit if the piece is longer or shorter than desired will be obvious. Any effort required to adapt

the molding piece, because of variation in its length – a little too long or too short - represents Quality Loss, a concept introduced and developed in Japan by Genichi Taguchi.

contributions to a new definition of quality. Specifically, as noted by Larry Sullivan, he defined quality as “the minimum of loss a product causes to society after being shipped.” By contrast to the mass production

Figure 2 – Marking a piece of wood molding before cutting it to size



As shown in Figure 3, Taguchi’s Quality Loss Function model increases continuously as the piece of molding length misses the target by larger and larger amounts in both directions – shorter or longer than the desired target dimension. In either case, the extra effort is both finite and real, just as the use of hammers to assemble parts at the Ford plant were finite and real to Frank Pipp and his assembly team. Could it be that such losses are accounted for and then reduced through routine efforts within the Toyota Production System to better align the organization’s resources? That is, the resources of time and effort would be invested to produce a given dimension closer to its target value, but only if this effort was less than the corresponding reduction in loss, thereby making the effort a worthwhile investment of resources. According to personal conversations with Genichi Taguchi, Toyota has been a world-wide leader in the use of his Quality Loss Function concept to direct efforts to move from the traditional “part” quality model to one in which a greater emphasis is placed on “relationship quality,” as in “how far from the target value is a given dimension?”

According to Genichi Taguchi, Toyota’s efforts with the Quality Loss Function date back to his consultation role in the early 1950s. Within ten years, he was honored in Japan with a Deming Prize in Literature for his

system’s “conformance to requirements” model of quality, which remains the standard of quality in systems such as “Zero Defects” and “Six Sigma Quality.” Taguchi suggested a model that looks at quality from the vantage point of the relationship of a producer to its customer. In doing so, Taguchi acknowledged the existence of a never-ending connection (and impact) between the provider of the “part” and what it is “part of”. The technical aspects of this holistic model are shown in Figure 3, where the horizontal axis represents the specific value of a part dimension on a continuum and the vertical axis represents the associated “Quality Loss” for a corresponding part dimension. If one considers the “Quality Loss” to be the “extra effort required” for installing a part of a given dimension, the distribution (“Quality Loss Function”) theorized by Taguchi - a simple parabola centered on the target dimension (with minimum loss at target), accounts for the loss associated with dimensions that are not produced to target dimensions.

Taguchi’s model brings in to question the mass production belief that all parts within the range of the tolerances are “equally good”, and, therefore, absolutely interchangeable. The degree to which variation from a target dimension produces harmful effects downstream in the “organization and society” is a function of the steepness of the Quality Loss

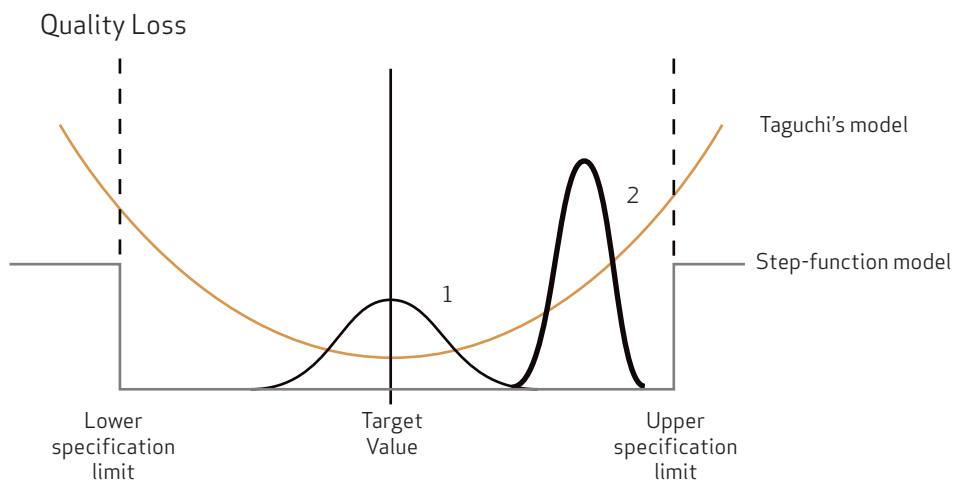
Function, which in turn depends on the specifics, or context, of the system which the part is actually a “part of”. Of foremost importance, Taguchi’s model suggests that interchangeability be modeled as something that is relative and not absolute.

By comparison to Taguchi’s model of continuous Quality Loss, the mathematical model associated with the mass production concept of “Zero Defects” is a “step-function.” Figure 3 offers a side-by-side comparison of these models. In keeping with a step-function model, all parts within tolerance are “good and equally good”. No change in quality is perceived across this range and the only changes in quality that do occur happen instantaneously at the transition across either of the two manufacturing tolerance limits. Inspired by Taguchi, and influenced by Deming, Toyota has long modeled quality as a continuous feature, rather than discrete, with a preferred value (target) that provides for minimal loss. Such a view leads to the conclusion that any deviation from a target dimension results in some degree of loss being

imparted downstream by the part after its shipment to the customer.

As a student of Drs. Deming and Taguchi, I have a special fondness for the systems thinking of Russell Ackoff and the interpretation of the Toyota Production System provided by H. Thomas Johnson, for what their thinking contributes to my evolving theory of how Toyota operates and I am constantly in search of explanations of lean that reflect the fabric of their combined approaches of. Beginning with this edition of the Lean Management Journal, I encourage our readers to think beyond the prevailing explanations of lean and consider the possibility that the fabric of the Toyota Production System is more closely aligned with the usage of Taguchi’s Loss Function thinking than has ever been acknowledged in the lean literature. This remains dominated by a part-like focus on efforts such as single-piece flow, standardization, zero defects, zero waste, and the elimination of non-value work. Such a focus needlessly limits lean to shop-floor applications associated with volume production and continue to view employees as interchangeable parts.. **END**

Figure 3 – Genichi Taguchi’s Quality Loss Function reflects a continuous model of part quality. Histograms 1 and 2 are examples of possible results for 2 suppliers of parts





In the first of a two part series, **Professor Peter Hines**, chairman of the Lean Enterprise Research Centre at Cardiff University and SA Partners, explores how multi-site organisations can develop a durable lean approach.

Staying lean

Over the last 20 years of our lean journey at the Lean Enterprise Research Centre, the type of questions we are asked has evolved from “where do I start?” and “who should I involve?” to more pragmatic questions such as:

- **How long is it before the benefits start fading away?**
- **Why do people seem to have lost their enthusiasm for Lean here?**
- **How do you ensure continued buy-in from the workforce?**

The challenges in staying lean are often rooted in a preoccupation with lean tools and a need to have a fast-track “hero story” that can be produced by taking a kaizen blitz approach rather than careful and systematic culture change; slower in producing noticeable results but far more durable.

Thinking of lean application in terms of an iceberg analogy to clarify that it’s not what you see but what you don’t see (below the waterline) that is important can be very useful. During recent pilgrimages to Japan we learnt a lot about uncovering these unseen factors. We went to a series of manufacturing firms and what we saw on the shop floor was marvellous – we saw 5S, kanban, TPM, flow - all the typical lean tools and techniques that you read about in the many textbooks, but in addition to these tools and techniques and process-based management, we discovered that below this “tip of the iceberg” there were three key people related areas under the water that need to be acknowledged:

1 Strategy and alignment: A coherent strategy, vision and purpose that is fully communicated and deployed throughout the organisation.

2 Leadership: Characterised by guiding vision, passion and integrity. A leader must

have high energy levels, be innovative, focus on people, inspire trust, have a long range perspective and challenge the status quo.

3 Behaviour and engagement: The engagement of people on a lean journey is essential. It will predict their behaviour and your ultimate success.

Cogent Power’s lean journey is a fine example of an enterprise which has sustainably implemented lean through acknowledging the importance of the above factors. Cogent Power began implementing lean in late 2003 to improve its competitiveness in the marketplace and help turn around its financial performance. Today the company has a transformed approach, with a renewed customer focus that has led to exponential sales growth and a culture of continuous improvement.

In order to meet the challenges posed by substantial pre-tax losses from global operations, a static order book with emphasis on lower margin products etc. a new managing director was appointed in 2003 to lead the business turnaround. He implemented a new organisational structure, based around a head office in the UK and three operating divisions: Electrical Steels, Laminations and Transformers.

When the lean project began the culture and philosophy of the company was based on a traditional mindset driven by a culture of machine and labour efficiency. The main operational key performance indicator (KPI) was tonnes of output produced and as a result there were high levels of inventory but poor levels of delivery performance.

In the first part of this article we take a look at how Cogent Power tackled the first two “under-water issues” in the Sustainable Lean Iceberg framework. Strategy and alignment and Leadership.

Strategy & alignment

A successful strategy should begin with:

- **a realistic assessment of the current situation**
- **a coherent vision of the future**
- **an understanding of the transition required to bridge from the present to the future.**

Alignment then makes sure that everybody understands the strategy, and that everything they do contributes to the success of achieving the organisational goals. This can be checked by looking how KPI's monitor and measure progress. A link between the KPIs, the strategy and the lean improvement projects is vital to sustainable success if there is no link there will be waste and if the link is not worked on and understood with employees then there will be lack of clarity.

Cogent Power uses "business cockpits" to deploy and sustain the management process. The business cockpits are visual management systems used to display, everything that is important to running the business in all areas and at all levels. They show issues, improvement project plans, performance measures and key financial reports. They drive the day to day business.

The cockpits measure performance indicators such as OEE (overall equipment effectiveness), OTIF (on-time in-full), direct costs etc with particular relevance to each department and have all the information that the team leaders need to manage their sections and set targets and the information that process or functional managers need to manage their departments and the senior managers need to manage the business; and each has a clear link to the others. The cockpits are reviewed and updated regularly.

Leadership

Poor leadership can be identified as a top differentiating factor between success and failure in sustaining lean change and a common stumbling block for leadership is that it suffers from confusion with management.

Many people talk about managing transformations rather than leading change. Leaders, should foster change whereas managers stabilise the organisation and assure that the changes are well implemented.

Leadership is not confined to the top level of an organisation; leaders can emerge at all levels and part of the role of managers is to recognise and develop potential leaders so that they can contribute to the business goals.

Cogent Power's lean strategy included the reorganisation of the management team into a formidable force; highly respected and hugely influential and based on the belief that it is the responsibility of all managers within the organisation to spend time with front-line workers; going to the place where the action is happening – This "Gemba" management is a critical element of lean leadership, crucial to sustaining lean.

Leadership is important at every stage of lean transformation, but particularly at the start and during the "it isn't worth it" phase when management typically becomes extremely unhappy as the benefits often appear smaller than the pain of gaining them, usually somewhere between 18 and 24 months after starting a transformation. It was during this period that Cogent Power recognised that the middle managers were struggling due to a top-down and bottom-up approach that neglected the middle managers, who were being asked to manage the lean transition but did not have the same level of skills as the people they were managing. To re-engage the middle managers a lean management training programme was developed called "Living the Lean Lifestyle". This programme focused on giving managers new skills that emphasised the change in roles and responsibilities expected of the entire leadership community as it went forward. The programme challenged individuals to continuously push themselves and their teams out of the "comfort zone" and into the "stretch zone" with an emphasis on the importance of values and behaviours needed to lead the organisation into the next phase of maturity. This provided fresh impetus at just the right moment for the programme.

In the next part of this article we will take a look at how the last of the "below waterline" aspects of sustainable lean need to be approached and look at the methods used by Cogent Power to overcome the challenges involved. Finally I will conclude with my overarching comments on the integral characteristics of lean sustainability and the way in which these support the key tenets of quality, cost, delivery. **END**

Gold standard healthcare the lean way



David Howard is a performance improvement practitioner for The Manufacturing Institute. After 20 years of leading world class improvement programmes in manufacturing environments, David is now also successfully mapping the same techniques in healthcare. Working in partnership with several National Health Service Trusts, he has proved that organisational change and sustained improvement can be achieved using the same principles of strong leadership and lean deployment that have transformed major producers worldwide. Here he expands on ways to align best practice lean methodologies with organisational strategy to achieve sustainable improvement and profound cultural change across the entire hospital supply chain for better care, better quality and lower costs.

Lean methodologies that have revolutionised manufacturing are achieving impressive results in hospitals. Many healthcare managers are using the principles, systems and tools of Lean to stretch limited resources, improve the quality of patient care and safety, eliminate errors, reduce waste, cut delays and reduce the length of patient stays.

Lean provides, perhaps, the best opportunity to achieve gold standards of healthcare – offering a proven route to better care, better quality and lower costs

– and succeeding where a raft of political initiatives have failed to make their mark.

How can management systems from industry work in healthcare?

Some people argue that healthcare is a totally different environment to industry and that lean cannot be transported successfully to a patient focused environment. But a factory and a hospital actually have more in common than is first apparent. Both environments run complex processes where the scope for errors, quality problems, poor communication, waste and the failure to put the customer first is colossal.

There is a general misconception that lean in manufacturing is easier because, essentially, it's all about making machines work. The truth is that the biggest challenge in both environments is people and cultural issues, and in that fundamental respect for the solutions and systems employed are very similar. The bottom line for both groups of people is that they see the value of lean when they see the benefits and so gaining some "quick wins" is particularly important.

A common concern is about patients being treated as "an item and not a person", and that with lean the human side of healthcare provision would disappear. This latter point is easily refuted. lean does not reduce the



contact between patients and doctors: instead it focuses on reducing non-value adding activities, which usually means all activities that do not involve patient contact and therefore increases the time available for patient contact.

Another argument sometimes made is that every patient is different, but every product is the same. Lean, though, defines quality as conformance to requirements, in effect reducing the variance of a product or service compared to given standards. Similarly, improving quality in healthcare does not mean shoe-horning patients into treatment pathways, but rather identifying care procedures that are shared by groups of patients and ensuring that each patient is placed in the correct group. In other words, it means treating patients as individuals but offering similar treatments if they are categorised similarly. Lean, meanwhile, ensures that the treatment categories function at maximum efficiency.

Why lean healthcare?

There are huge advantages to using lean in healthcare because it determines a new culture and system of checks and improvements – providing a sustainable methodology to continuously improve services. The NHS has a long history of trying to improve services against aggressive goals, but it lacks a sustainable methodology to achieve those goals and avoid the need to constantly set new ones. Everything that happens in healthcare – procedures, appointments, bills – is a process. The challenge is to improve and continuously do it better time and time again.

Lean healthcare involves a radical rethinking of working procedures in hospitals and elsewhere and a long-term commitment by management at the highest levels. The Manufacturing Institute firmly believes that this is not only desirable but crucial, for several urgent reasons:

- **Productivity improvement targets for UK hospitals and Trusts including an 18-week target from referral to first definitive treatment, which is likely to become a 13 week standard in the near future**
- **The requirement for a 31-day cancer pathway**
- **A maximum four-hour wait in A&E following admission**
- **A target three per cent year-on-year cost reduction**
- **Action to achieve Foundation Trust status – and that in itself demands a robust improvement strategy.**
- **Environmental performance goals, including the proposed Carbon Reduction Strategy**
- **The urgent need to control and prevent infection**

In hospital operational areas (wards, theatres, diagnostic departments, outpatients, etc) lean can achieve many tangible benefits, including reducing patient waiting times and faster preparation of operating rooms. It enables an organisation to discover the reasons for poor quality, for poor delivery, for poor management.

Whatever the challenge, the truly lean organisation can harness the ideas of its people to deliver even better care, and world class performance – freeing up clinician time to spend more time with patients, indeed to “End Waiting, Change Lives”.

Overcoming barriers and challenges to lean healthcare

There are many stumbling blocks preventing the successful translation of lean intent into successful outcomes and it is essential to be aware of some of the major barriers:

1 The lean pillar of respect is fundamental to success and that means listening to people, involving them and empowering them to make the lean changes from the bottom up. This is particularly powerful in a healthcare setting where by truly engaging

with staff it is possible to unleash the power of hundreds of people to bring about big changes. But unless senior management demonstrates total commitment and buy-in to lean and gives others the freedom, power and authority to improve their department or function, the momentum will slide.

Underpinning the pillar of respect is the culture of Gemba Kaizen, a belief that everyone working in a system has the key to improving their work and empowering them to drive improvements in their local workplace. In a lean transformation, problems are surfaced and resolved in order to improve the organisation and it is therefore a necessity that all workers, from board level to shop floor, are trained to improve their work and are equipped with the tools and techniques to solve problems.

Lean will only work properly if it is driven from within. It is particularly important to prepare a tier of staff at all levels and within all disciplines to lead and champion lean – to promote a culture of continuous improvement and mobilise and involve everybody.

2 Resourcing lean improvement is also an issue, particularly in the continued delivery of improvement activity. To sustain improvement, it is often necessary to have dedicated lean champions and a support structure to keep the momentum going. There is a natural tendency for people to switch off once they have achieved their initial business improvement objective, so it is important to have committed people relentlessly driving continuous improvement forward.

3 Another people issue is securing clinical engagement. There is often a “them and us” management/clinician divide in hospitals and bridging this divide is crucial to successful lean implementation.

4 Hospitals do not function in isolation, they are part of a complex supply chain comprising Strategic Health Authorities, Primary Care Trusts and community-based services. Inefficiencies at any point in the supply chain can undermine progress in any other point. Joined-up-thinking is critical and it is crucial to change working methodologies throughout the system to optimise improvement opportunities. This is particularly relevant as government changes are likely to change the landscape of healthcare provision.

5 Initiative overload is another barrier to progress. As well as breeding a sense of weariness and initiative fatigue among staff, it causes confusion and makes it difficult for units to prioritise which areas of improvement are most important.

Lean implementation and principles
When our lean practitioners go into any organisation they identify all of the process inputs to work out where value is being added for the patient and where it’s not. This is similar to a medical diagnostic process where the symptoms are identified to understand the current condition and issues. Next step is to work with the relevant team to develop solutions for eliminating all the non-value added steps within the process. The aim is to cut out those factors that are a waste of time, money or resources. In a healthcare setting, it needs to be totally focused on putting patients first.

Good lean practice is not based on finding quick, temporary solutions, but instead concentrates on how the work is done and how to eliminate the root causes of delays and other impediments to flow. It is easy to blame human error, but in the healthcare sector humans have to work within often highly complex systems, and it is usually the systems themselves that are the cause.

Five key steps to lean can be applied to healthcare and these are:



1. Specify value in the eyes of the customer

Patients expect to receive the best care and service that can be provided, free of errors. This means identifying best practice in every step of the patient journey, both information and physical flow, and then rigorously applying gold standard work. This could mean always labelling samples at the bedside, applying care bundles rigorously, or eliminating opportunity for transcription errors by using IT effectively.

2. Identify the value stream

It is useful to start at the end of the process and follow the activity right back to the beginning. This is because the process of discharge often holds up the whole healthcare system, whether this is blocked beds, or follow up appointment processes.

3. Make value flow...

No manufacturer would ever run every asset in the value chain at 100 per cent. Customers would never contract to use all the capacity of every supplier, as they know this would guarantee failure the moment there is a small change in demand. But hospitals often run their wards at 100 per cent occupancy. To enable patients to flow safely, there has to be unused capacity. This is actually more economic because the hidden waste in dealing with the errors, cancelled appointments, initiative lists, missed targets and lost activity is eliminated. This means turning the traditional accounting on its head, and focusing on giving value to the patients rather than on measuring activity and cost.

4. ...so the customer can pull.

When a service is capable, adequate and available, with good flow, it is possible to move to a system that is pulled by patient demand, rather than pushed onto the patient. The possibilities of this are very exciting: No need for outpatient appointments and waiting list procedures, just turn up at a convenient time.

5. Continuously improve in pursuit of perfection

Visual management is essential to show what has been achieved and how to improve. This ensures patients can easily see what has been done to make their service better. The lean organisation will challenge every team to have a daily review, and write on the wall what the staff will do to make tomorrow even better than today. The difficulties or challenges encountered in achieving each of these steps will vary from institution to institution depending on the inherent work culture and conditions but every step is essential and must be addressed if improvements are to be gained and sustained.

The Manufacturing Institute has partnered blue-chip enterprises, healthcare and public sector organisations in the UK and Europe over the last 14 years and has helped all these different sectors to understand their individual needs. Their more recent work with a whole gamut of NHS Trusts is helping to transform the care given by hospitals such as Stockport NHS Foundation Trust; Blackpool Fylde and Wyre NHS Foundation Trust; Southport and Ormskirk Hospital NHS Trust; West Middlesex University Hospital NHS Trust and Royal Devon and Exeter NHS Foundation Trust. Later issues of LMJ will provide the opportunity to gain insight into detailed case studies of the challenges faced by some of these institutions and the methods found useful in tackling implementation and change. More information about these lean initiatives and others can be found at www.manufacturinginstitute.co.uk/healthcare
END

Editor Comment

"It is a valuable lesson for lean practitioners to see the parallels and differences between lean thinking being applied in its traditional manufacturing environment and lean in new areas like healthcare. Acknowledging why principles developed from the automotive industry can help to improve patient care gives lean practitioners across sectors the opportunity to return to the fundamental principles of lean and refresh their view of value and how it is created. I think there could be real benefit to practitioners in a case study demonstrating how different needs will result in different outcomes and I look forward to see this mapped out in future articles"



Construction with lean foundations



After its foundation in 2000 the first three years of the CLIP programme were spent adapting the tools and techniques, used widely in manufacturing, to the construction environment. This was a vital step as although there are similarities between manufacturing and construction, there are fundamental differences in the way the two industries operate and think. Unlike traditional manufacturing, construction is a nomadic industry where it is very rare for a project team to remain together after the completion of a project; also it traditionally operates in a culture of “command and control” with project management teams telling subcontracted organisations how and where they will work. Typically construction projects are “one-off” designs that are never repeated, which fuels the perception of construction as a craft industry rather than manufacture. All of these elements combine to create an environment where learning is very often lost from one project to the next and that the knowledge of the expert subcontractors is often overlooked. As anyone with experience of lean implementation will be able to see this kind of environment is bound to disrupt and challenge any vision for continuous improvement.

However, knowledge gained in CLIPs three year pilot showed that with careful application our industry could still gain untold benefits from lean. In 2003, CLIP was officially launched with the remit of providing assistance and support to companies; improving competitiveness and efficiency.

If you look at the history of lean implementation as the length of an average lifetime, lean in construction has happened during the last breath you took. Driven by the 1998 Egan Report “Rethinking Construction” and the findings of the Industry Forum the Construction Lean Improvement Programme (CLIP) has been working with construction companies since 2003 to introduce a structured approach to change. Here **Claire Corfe**, master engineer at CLIP, shows how the organisation has methodically transferred the lean principles created in the automotive industry into the construction environment in order to tackle low productivity, out of control costs and poor quality. She shows how Egan’s comment “You have to work as a team. If you don’t work as a team you are going to fail” gives a grounding for their approach to sustainable change.

Being Part of the Team

For construction, the intrinsic lean principle of removing waste from the work system means focusing on improvements to cost, programme delivery, quality of the finished structure and safety performance. The waste that we look to remove is categorised by the “7 Wastes” – waiting, overproduction, rework, motion, process, inventory and transportation.

However, there is an oft-missed eighth waste that lies in the misuse of people and it is this which often differentiates between success and failure for a project. People waste is characterised by a failure to take advantage of the knowledge and experience of the people who work at all levels within the organisation. If you are ever passing a construction site, look out for the basket by the front gate where workers leave their heads before coming on site and being told exactly where, when, and how to move their arms and legs in order to build!

When we ask the people who do the work to be involved with the planning and improvement of the work, projects always make greater progress.

Firstly this is because there is a better pool of real workforce knowledge of how to do things in the best and easiest way, and secondly because people buy into a process that they are having an influence on. Projects need to consider what motivates their people and invariably the greatest motivator is people feeling valued; when we involve people in their work and help them to put ideas in place to make it better, they are more motivated, benefiting them, the company they work for and the final customer.

Gaining this level of involvement however will require an investment in time and effort. Engineers with lean knowledge need to work with people at the workplace or with those who perform the process that is being focused on, working on the project in real time. Tools and techniques applied on the job will be of far greater value than any that are taught in a classroom and then checked back on. When CLIP engineers assist a project in this way it means we get to be part of the team, working alongside them: coaching, motivating and guiding people. We help them see how the lean philosophy can be applied to their own work in a way that allows them to continue with their new approaches when we are gone.

Key to enabling continuous improvement are what CLIP call the “5 Sprints”. Their purpose is to foster lean culture. They are not sector specific and can be applied to any discipline, indeed they are a fair guide to the way we should live everyday life. The “spirits” are shown inset.

1 Challenge all the fixed ideas. We value the experience that comes with people, but sometimes that experience conspires against us. Why do we do the things we do in the way we do? One of the most common answers to this question is “because it’s the way we’ve always done it”. Construction has always been based on tradesmen with great experience passing that knowledge onto those just starting out. That is a great way to capture best practice, but also a great way to repeat out dated or inefficient practices.

Questioning fixed ideas is a way to encourage the separation of the person from the process; it is about getting people to challenge the process to make it easier for the person or more effective for the final customer.

2 Do it now! No excuses. We all have experience of one of those great team building days where we all get together and get ready to change the world...after we’ve answered our e-mails or maybe on the next project, sometime. Change is easy to plan but often very hard to put into effect. Once a team has decided what they need to do in order to improve, this must be acted immediately. Get people ready to have whatever telephone calls discussions that are needed – removing the excuses to make it a simple step.

3 Use your wisdom, not your money. When we come across an issue, our natural reaction is to throw some money at it, whether this is in the form of resources or a new software system. If we make the effort to understand the root cause of the issue (see the next “spirit”) we often find that the issue can be solved and prevented from reoccurrence by using our collective knowledge to make a small change to how we do something.

4 Get to the root cause by asking WHY? - 5 times. “I keep six honest serving men, they taught me all I knew, their names are what and why and when and how and where and who” (from “*The Elephant Child*” by Rudyard Kipling). These “honest serving men” are some of the most powerful words in the English language, with “why” being one of the most versatile and useful. Asking “why” 5 times is a skill that all children have; as adults we discard it but it is often an excellent way to get to the root cause of a problem.

5 Improvement is infinite – Better is not good enough. By definition continuous improvement never ends; once you have made an improvement, celebrate it and then ask “what next?”. Implementing any change takes a certain amount of drive, if you make an improvement or change and then sit back and relax, you lose momentum and impact and future improvements will not benefit from your first. Take things in small, logical steps and you’ll soon have a team of people who think innovatively naturally and for minimal effort you’ll see a big difference when you look back.

Where does it start?

Experience shows that any organisation wide change management needs an ultimate drive from top level management - they must be committed to the change and show this in their words and actions. It means having a consistency of purpose - one goal that everyone is focussed on supported by top level understanding of the purpose of lean philosophy and by engagement throughout the workforce.

Pilot schemes can help to gain buy-in from where it matters most. Beginning a programme where it matters most – at the point of value, on the construction site can allow a small team of people to start a ripple effect that radiates through the business. Lean is about involving and empowering people at all stages of the transformation; get them involved at the start by communicating objectives and getting input from them. Advertise progress in all areas showing success and failures, with reviews and actions at each stage. Give teams the ability to change areas that affect them directly in line with company objectives, e.g. how they do particular processes or report, or set up their offices. Management must be aware of not dismissing any suggestions for improvement without a good reason for how it moves away from the company goals. **END**

Further information...

For more information on CLIP contact Claire Corfe at corfec@bre.co.uk or 01923 664228.



CASE STUDY

Oakwood Builders and Joinery Ltd

Sarah Fenn, Oakwood's financial director, explains how CLIP helped the company to improve efficiency and productivity, foster strong team working and enhance their professional image.

Oakwood Builders and Joinery is a company that has experienced significant recent growth – developing from a small family firm to a larger company with sister companies alongside. The main work undertaken comprises high-level refurbishments for private clients. We were looking for a way of maintaining and enhancing our professionalism and forward thinking, and to ensure that we operate as efficiently as possible and to the satisfaction of our customers.

We used the lean improvement tools below to examine our practices, identify where improvements were needed and visually represent our planning.

Process Mapping – Visually representing work processes using colour coded post-it notes to identify who does what – and when, why and how they do it. It is important to fully understand the processes that you are trying to improve.

Collaborative Planning – a structured approach to planning activities that encourages input from everyone involved in the project. The team produces weekly plans based on what work can be done, and reviews the previous week's plan to highlight areas of improvement.

Visual Management – the details of a project's status are openly displayed so that everyone involved can clearly see its historical performance, its "here and now" progress, and any future potential problems. This highlights any improvements and actions needed, quickly captures snags that can then be analysed and dealt with before they hamper progress. It

demonstrates to all that the team has the project under control. Wherever we have implemented the visual management technique, this has generated a natural improvement in team-work, forward-thinking and planning.

We used process mapping to focus on the way in which we recorded costs, work progress and variations, and invoicing customers for work completed. It helped us to identify delays, gaps and inefficiencies in these processes so that we could set in place simple actions at the right points in the projects to make the process of application for payment much simpler and timely. Overall we improved the delays in cash flow we were experiencing due to late applications by over 3 weeks.

Having applied collaborative planning and visual management and found them helpful, we adapted them to our particular circumstances to develop a visual planning tool that has been added to our routine practice. This addition has resulted in excellent reactions from clients and has created opportunities with future clients, enhancing our professional image.

We have taken a flexible approach to how each site wants to use the visual planning tool and where appropriate on our smaller projects, simplified versions are used with whiteboards for action lists or marker drawn plans. A recent project was undertaken without using the visual planning tool and by the end of the project the team agreed that the project had not been as controlled, or significantly, as profitable, as the projects running the tool.

Overall, this approach has supported our aspirations to be intelligent builders in a professional, forward thinking company. We have achieved a cultural change that has enhanced planning and improved communication and organisation in the company. Crucially, where things have changed, the effects have proved to be sustainable.

Our world is changing;

FMCG are forming new paradigms for lean

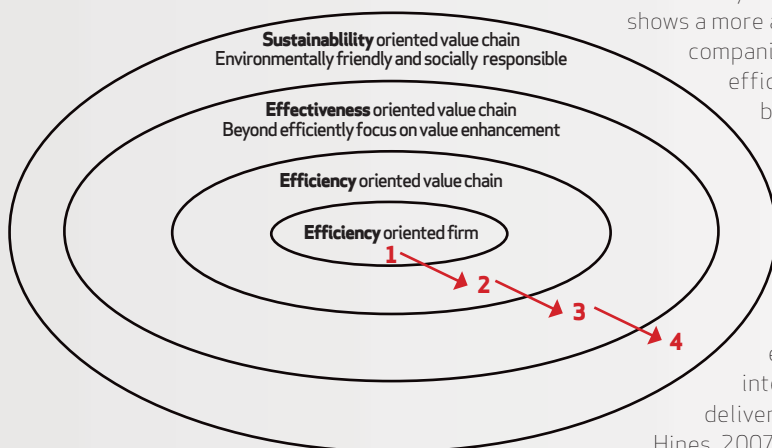
Dr. Keivan Zokaei of the Lean Enterprise Research Centre, Cardiff University reports on the key findings from a major study into the UK Fast Moving Consumer Goods (FMCG) industry mapping 33 extended supply chains from primary production through to consumption. Moving from point analysis of individual issues FMCG has moved a more holistic approach to improvement, from efficiency to effectiveness to sustainability and other sectors need to follow in their footsteps. The article aims to highlight ways in which “true lean” can shape the future of FMCG. Using Tesco’s approaches by way of example it will identify some of the challenges and opportunities on the horizon.

The FMCG industry is a source of inspiration for operations and marketing managers across different industries around the world. In the current economic downturn when the automotive and construction industries have nose dived, companies such as Tesco and Walmart Carrefour have been going from strength to strength. This is partly down to the less credit dependent, nature of the FMCG sector, but is also attributable to close customer relationships, adopting principles of lean thinking and a relatively mature understanding of the “voice of society”. Lean (sometimes referred to as Efficient Consumer Response in the FMCG sector) has become a cutting edge concept in the growth of FMCG companies acting as an important vehicle for ideas and best practice dissemination. The results of



the VCA study on which this article is based are illustrated in Fig. 1. From these and other data valuable insight was gained into the levels of both efficiency and effectiveness operating in the 33 supply chains involved.

The inner layer represents companies which were squarely focused on internal efficiency improvements, the second ring shows a more advanced situation where companies had learnt to collaborate for efficiency opportunities beyond the boundaries of the single firm, finding synergistic solutions. The third ring represent even greater maturity in value chain management wherein chain effectiveness becomes an established theme; aiming to understand the needs of the end-consumers and realigning inter/intra firm processes to deliver superior value (Zokaei and Hines, 2007).



The outer ring represents the final stage in evolution for FMCG value chains where economic, environmental and social sustainability are simultaneously taken into account. The two inner rings relate to the industry's present paradigms while the outer rings represent should be situations and give a guide for future advancement. The model aims to illustrate that the focus should continue to evolve from supply chain efficiency to supply chain effectiveness and whole system sustainability.

Creating Efficient FMCG Value Chains

There are numerous case studies detailing how cooperation between manufacturers and retailers leads to considerable benefits for all stakeholders as well as the shoppers. There is no doubt about the value of the paradigm shift from single firm efficiency thinking to cross company collaboration and the benefits of whole chain efficiency thinking are well documented (Womack and Jones, 1996). However, there are significant gaps between the downstream and the upstream of the FMCG industry in this respect. The VCA project recorded considerable efficiency differences between farmers and primary food producers compared to branded product manufacturers and large retailers. Issues related to both in-house efficiencies such as machine utilization and chain efficiencies such as delivery performances and demand management. The following table compiles the key findings across the VCA project.

Remarkably, the project identified similar results across different products and channels. Also, the results show that the emphasis of the value chain analysis work has been on efficiency factors such as transport, quality, demand management and inventory levels but that there considerable gaps in efficiency performances between the upstream and downstream parts of the industry remained. For example, on-time/ in-full (OTIF) delivery performance in the downstream of the 33 chains mapped were consistently in the high 90 percentiles

No.	Concern
1	Quality issues and product loss
2	Demand management and waste in information flows
3	In-house operational inefficiency at different levels in the chain
4	Transportation inefficiencies
5	Supply chain structure and power imbalance
6	Lack of trust and collaboration
7	Lack of contracts and risk share agreements / opportunistic trading relationships
8	Lack of consistent measurement of operational performances at the whole chain level
9	Inventory management issues
10	Lack of understanding of consumer requirements

whereas in the upstream OTIF was recorded as low as 52 per cent. Inventory levels in most chains decreased in a similar pattern. Evidently, whole-chain efficiency thinking has considerable presence especially in the downstream parts of the FMCG industry whereas the upstream end shows considerable capacity for further efficiency improvements.

Translating future challenges into opportunities

Simply put, efficiency is about doing things right and effectiveness is about doing the right things. In the same vein, value chain effectiveness is defined as attainment of consumer satisfaction and value chain efficiency is defined in terms of the reciprocal of the resources absorbed. Efficiency is improved through waste elimination, i.e. reducing the input levels while increasing the output levels. On the other hand, value chain effectiveness can be improved through enhancement of the value proposition, for instance new features could be added to a product to fulfil an unmet consumer need or the chain setup could be altered to deliver a better service. Accordingly the concept of value chain effectiveness encapsulates agility, adaptability and alignment referred to as

“What was observed during the VCA project was the issue of misalignment of supply chain activities (and arrangements) with consumer value as well as supply chain members”

the Triple-A principles (Lee, 2004). As discussed earlier the third and the fourth rings in Figure 1 signify “should be” situations for the FMCG industry. The third ring is about creating effective FMCG value chains. What was observed during the VCA project was the issue of misalignment of supply chain activities (and arrangements) with consumer value as well as supply chain members’ inability to demonstrate clear cut appreciation of consumer requirements in many instances. Both of these indicate a lack of focus on consumer needs or value chain

ineffectiveness. The VCA project created a rare opportunity for the team members to connect supply chain activities with the actual requirements of the end consumers.

Of the 33 chains mapped in the VCA project I investigated 23 chains in detail and found evidence of chain ineffectiveness in at least 19 chains (82 per cent). Analysing my sample in-depth using both primary and secondary evidence, I documented 31 different examples of ineffectiveness (several chains showing multiple cases) described inset. The depth of the analysis (three to five months mapping each chain) arguably makes-up for the relatively small sample size. Readers should also be aware that the lack of reported evidence of ineffectiveness in 18 per cent of the sample is not necessarily indicative of an effective chain. For example in one of the chains where no evidence of ineffectiveness was detected, the scope of the project was restricted to the operational and efficiency issues and the focus was only on two upstream organisations.

Examples of ineffectiveness in FMCG value chains

1 – Pork chain

Concern – Pork chops and loin were mapped from farm through abattoir and processing and a food service company to a public sector organisation. Although focus groups continuously revised characteristics of the final products and satisfaction of the end consumers the product specs (communicated with the suppliers) had not been reviewed since established in 1963. For example, pork chops were being reformed into the shape of a loin at the processor due to historic reasons, i.e. lack of refrigeration on some navy submarines in 1963 and reforming helping to preserve moisture for longer storage. However, from the consumer point of view the necessity was gone. There was a

0.5 per cent saving on consumer price by eliminating the reassembly process. Furthermore, the Bone-in Loin product mapped during the study, needed to be trimmed at the canteen. The bone had no value to the end-consumer and little value at the processor. It also created unnecessary waste.

Cause – Lack of joint focus on consumer value. Little communication and transparency in the supply chain regarding needs of the end-consumer.

Countermeasure – About reforming loin chops, it was decided not to carry out reforming anymore. About bone-in loin, a questionnaire was sent around to a large sample of canteens and concluded that boneless loin should be listed instead of bone-in loin.

Case study

2 – Beef chain

Concern – Shelf-life of the beef product was based on a technical assessment that was several years old. Improved processes had reduced bacterial counts, but this had not been reflected in the shelf-life. Adding this extra time to shelf-life would result in higher shelf stocks leading to increased availability and therefore better consumer value.

Cause – Lack of joint focus on consumer value. Little communication and transparency in the supply chain regarding needs of the end-consumer.

Countermeasure – Raising participants' awareness by alluding to the problem.

3 – Potatoes chain

Concern – Up to 40 per cent of potatoes are rejected due to not meeting specifications. Reasons for rejection could vary, e.g. being damaged, wrong size and general misshape. However, rather arbitrary standards were set in terms of packed potatoes sizes, i.e. 45 mm. It was not clear why the standard has been set at 45 mm. Certainly it was not based on consumer research although it was generally accepted that very small potatoes were not acceptable. Another constraint was size of meshes at processing stage. Farmers only got paid for what was being packed and changes in product specifications had disproportionate impact on farm incomes, in similar example it was established that if the amount of

product that ended up on the supermarket shelf – the “pack-out” rate – was increased by 5 per cent (i.e. from 60 per cent to 65 per cent), the budgeted farm profit would increase by 60 per cent. Moreover, processors and retailers held the key to vital information regarding what percentage of produce hit the target and rejection root causes. However, this vital information was not passed down the chain, i.e. zero feedback to farmers on quality and quality root causes.

Cause – Lack of joint focus on consumer value. Little communication and transparency in the supply chain regarding needs of the end-consumer.

Countermeasure – Raising participants' awareness by alluding to the problem.

In the above examples, it is obvious that considerable inefficiencies occur simply due to failing to understand the purpose (i.e. consumer value) or not communicating it across different levels of the chain where possible inefficiencies were measured in financial or operational terms. Having said this, it is not always possible to assign measureable values to ineffectiveness issues since the main opportunity is in attainment of consumers' loyalty. A key challenge is “how to ensure alignment of chain activities with consumer value”? The author devised a methodology for mapping and aligning value chains with consumer value which borrowed from lean and policy deployment (Akao, 1992) and was tested across several FMCG chains with significant results. This approach (previously

described by Zokaei and Hines (2007)) captures the “voice of the consumers” and then categorizes the main dimensions of consumer value to link each to at least one relevant chain attribute.

However, aligning the end-to-end supply chain to the “voice of customer” is only part of the challenge facing the FMCG sector. An even greater issue could be understanding “voice of society” especially on topical issues such as global warming and corporate social responsibility.

A staggering 42 per cent of the total global warming contribution of the EU-25 countries is attributed to food, beverages and related activities such as cooking and eating out. Animal foods such as meat, poultry and dairy

products can be singled out accounting for more than 50 per cent of food related Green House Gases (GHG) while transport of food products to the point of sales accounts for less than 2 per cent (Tukker et al, 2005). In the UK a recent study shows that at least 19 per cent of our GHG's can be attributed to food chains (Garnett, 2008) contributing a mere 8 per cent of the GDP. Such disproportionate impact on the environment requires immediate attention from FMCG firms.

Visionary companies such as Tesco and Walkers have placed environmental concerns high on their agenda. Achieving a huge deal by adopting a systems view of their end-to-end supply chain. Walkers crisps for example realised that, despite 44 per cent of their crisps footprint being in farming, for consumers, it is ultimately the focal firm in the chain that bears the responsibility or conversely reaps the benefit of being perceived as "green". Walkers therefore decided to be proactive about reducing emissions from their end-to-end supply chain and also to carbon label every pack of crisps consumers buy. Since 2001 they have delivered 33 per cent reduction of their footprint and have also committed to further reductions year-on-year by setting realistic yet challenging targets. The keywords for creating green supply chains are whole systems approach and innovation.

The issue of creating environmentally friendly value chains is complex one, not least due to the limitation of our knowledge and methodologies. It is difficult to define which available options will provide real results as demonstrated through FMCGs experiment with the apparently less green house gas intensive biofuel; biodiesel. This revealed indirect consequences on the environment such as the clearing of native ecosystems and an overall release of 17 to 420 times more CO₂ than the annual GHG reduction that biofuels provided (Fargione et al, 2008). In this case the supply chain is not the right unit of (environmental) analysis and

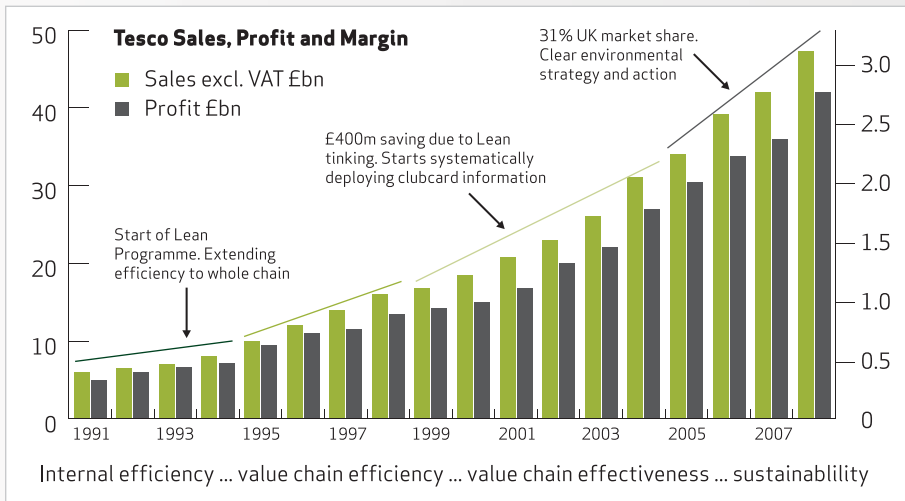
the knock on economic effects should also be taken into consideration.

But despite the convoluted nature of environmental concerns there is no excuse for avoiding it. Tesco has formed ambitious plans to tackle the problem and to address the "voice of society" whilst simultaneously remaining en-route to become world's second largest retailer by 2012. In January 2007, Terry Leahy CEO of Tesco said "We [Tesco] will measure and publish our total carbon footprint as a business across all the countries in which we operate [...]. We will also increase our understanding of our indirect carbon footprint - the emissions created by our suppliers and customers - so we can work with them to reduce our overall impact on the environment. We want to do this openly. So we will publish our carbon footprint, in a similar way to our price checker, on our Tesco.com website [...]. Consumers have a new need: to live more sustainably, and to consume products and services which are more sustainable. Our role as a business is to give them the information and the means to achieve this change. If we satisfy this need we will be rewarded with custom and loyalty" (Leahy, 2007).

What are our lessons from Tesco?

The leading FMCG firms are evolving beyond efficiency and physical aspects of chain management to focus on consumer enrichment (effectiveness) and social responsibility. The supply chain functions have a critical role in delivering consumer value and consumer enhancement where there exists overlap with marketing.

Tesco has arguably achieved an efficiency and effectiveness approach which can be mapped against all four layers of Figure 1. Tesco's full year results for 2008-09 reveal that the total Group revenue increased by 15.1 per cent to £54.3bn exceeding their £1bn per week sales goal. Tesco has put value chain effectiveness first for many years deploying Clubcard data to closely monitor consumers and create the most



effective supply chain the industry has witnessed. Every store's range and offering depends on the local shopping profile, and promotions are customised to individual household shopping needs.

Moreover, Tesco has been adaptive in understanding its shoppers financial strains and extremely agile to react to the ambitious expansion plans of discounters such as Aldi and Lidl. Firstly, Tesco launched its discount range (to become its fourth largest range alongside "finest", "life-style", "own-label" and "value" ranges). In late 2008, it cut the price of hundreds of articles and launched 350 new products in its "discount" and "value" ranges. Secondly, Tesco recently even trialled a discount store format in Scotland which primarily focuses on own-label and discount brands in a head-on challenge with Aldi and Lidl. Tesco draws upon the wealth of consumer information Clubcard provides to strengthen its effectiveness following the principles of agility, adaptability and alignment to "voice of customer". Companies such as Tesco are not only producing (and delivering) what the customers demand at the pull of the customer, but are collaborating with their customers and customers' customers to gain a deeper understanding of what the end consumers' requirements are and

provide the most effective solution. The translation of Toyota Production System showed us the benefits of "economy of flow" as opposed to the "economy of scale" (Womack and Jones, 1996). The severity of the current economic shock is suggesting that even flow thinking alone is not enough and it can be argued that we are progressing into an era of the "economy of purpose". Tesco's core business purpose to gain customers' lifetime loyalty reflects this. There is no mention of the share in your pocket, growth, cost or efficiency in Tesco's purpose. It's all about what consumers' value; about effectiveness. In this new age, value enhancement is arguably more important than waste reduction.

There are serious implications for the lean community in what Tesco has achieved. In a recent seminar broadcast, Jim Womack of the Lean Enterprise Institute said: "from [the] society's standpoint the reason organisations exist is to create value for consumers. [...] People are looking in the wrong end of the telescope when they think that the purpose of the organisation is cost reduction. So much of the lean movement up to this point has been focused, I think in an unbalanced way, on cost reduction as opposed to value maximisation which is what the customer really wants". **END**

No miracle cure



*Andy Spooner,
business
development
director, Suiko*

Looking at the business landscape one year on from the financial crash it is obvious that adaptability has been the key factor differentiating the survivors from the fallen, regardless of sector. Looking forward, it will be those that are able to link their current operational and financial activities with their needs for the medium and long-term future who will continue to transform and succeed. However, there is no miracle cure to ride out the current economic downturn and individual businesses will need to focus on different aspects of their operations to exploit the opportunities.

This article reflects the recent experiences of three change implementers, discussing ways of balancing tools and techniques, people and behaviours, results and practices to successfully tackle the “whys”, “whats” and “hows” of sustainable lean implementation.

Why? Leaders within an organisation need to provide a compelling reason for change and to start transformation with an end in mind. For many executives to “go lean” and embark on a journey to operational excellence will require them to unlearn what they have learnt before and to fundamentally shift their thinking of what is right. Lean cannot be seen as a “manufacturing thing” any longer; it is something that must be embraced across the organisation and throughout the organisational value stream.

Senior management must be clear on their vision for the business and its customers. Adel Jones, head of workforce

and organisational development, South Devon Healthcare NHS Foundation Trust found that “One of our greatest challenges, has been to balance the need for revenue with the need to improve patient care.” Making their lean improvement programme a strategic priority and underpinning the new ways of working has been “a very clear vision for the health community which will require a huge investment to redevelop the estate and community services”. Furthermore, “engaging the senior clinical leaders has been critical as they are incredibly influential; buy-in is achieved when becoming leaner is demonstrated to add value to patients - our customers”. This is clear demonstration that to support

a lean “call to action” there must be transparent management commitment-enabling everyone in the organisation to understand why the company has mapped out the direction it has for improvement.

Being clear on the need and potential size of the opportunity makes it easier to present a compelling case to take action too and LINPAC used its lean pilot scheme (started 4 years ago) to illustrate the potential to be gained through investing in a wider use of the programme. Mike Salkeld, head of lean enterprise, LINPAC Packaging quotes, “At Linpac, we didn’t start with a big bang. The first step was to assess “where we are now” (current state) and then map out “where we wanted to be” (future state). We were building on a base of previous initiatives and through the pilot we proved the methodology and started to develop LPOS (the LINPAC Packaging Operating System) to give a structure to our journey. Having got the confidence that it was working, the pilot site provided practical evidence for other rollout sites to see and this has clearly helped underpin the buy-in to the vision. The divisional vision for the start of 2014 is: zero accidents, a specific target for revenue growth and EBITDA, each site to have achieved LPOS Level 4 accreditation - delivering ambitious targeted saving through LPOS.”

Operational excellence can be seen as a journey which can be measured to assess progress and provide a framework against which to plan ahead. It ensures that the process inputs deliver the right outputs – i.e. the practices (a combination of tools and behaviours) that impact on the targeted results (performance measures). Mike Salkeld concurs. “Developing the LPOS assessment has helped at both a group and site basis for us to understand

where we need to focus our efforts and resources. Each site is assessed against results and practices which is a key input for the site roadmaps and detailed CI implementation plans.”

The challenge lies in getting the critical balance between results and practices, link the cause and effect and help people understand why “What they do and How that they do it” is important. Too much focus on results by relying either on a few key individuals or adopting a hit squad approach may get a short term gain. However, without investing in developing capability, the right environment and the appropriate business systems, it will not be sustainable. Equally excessive focus on practices without making the link to results will have a similar effect.

“At Linpac, we didn’t start with a big bang. The first step was to assess “where we are now” (current state) and then map out “where we wanted to be” (future state)”

Mike Salkeld, head of lean enterprise, LINPAC Packaging

Adel Jones illustrates the point. “As an organisation there has been a preferred management style of “reactive fire fighting”, our teams can move heaven and earth in a crisis, and will deal more readily with what’s urgent over what’s important. What gets measured gets managed and this behaviour is driven by issues around reward and our measurement of success which we are addressing. We have to measure what we really hope to achieve.” The Trust has taken a pragmatic approach. For example, “We have tried to address the annual issue of cost cutting towards the end of the budget period by driving two streams of

proactive improvement. Firstly, strategic longer term projects that are given the right resources and infrastructure to deliver and secondly, making continuous improvement central to the leadership role at all levels to deliver in-year waste reduction."

What? Arguably the largest commitment and the most important aspect of a lean transformation is "respect the people". Without it and if not addressed, it will become a major obstacle leading to a failure to adapt and deliver, with the change remaining another "initiative" rather than the "way of working".

“There must be an appropriate balance between embedding tools and the associated behaviours or between processes and people”

Richard Lloyd, of Constellation Wines, Australia and Europe, saw getting the people right was critical to ensuring they had the best chance of developing the right culture at their new site. Despite Avonmouth being a greenfield site they have transferred key personnel from the Whitchurch site. Lloyd explains "I spent six months at Whitchurch before we started to map out the new factory to fully understand both the strengths within the operation and what we wanted to do differently. Our selection of people was seen to be critical and we made a big investment in recruiting the right people. We were looking for people who would fit in and grow in the new culture. We undertook a full assessment process

starting with the manufacturing leaders through to the operators who were recruited on a 50-50 mix of technical ability and interpersonal skills. At each stage, leaders were involved in the recruitment of their own people to ensure we established ownership and accountability at the right level." He continues "The customer is at the centre of our operation and a focus of our induction and ongoing development of our people. For example, all our employees have a certificate in wine tasting and are educated in the wines that they bottle, essential if our people are to have a sense of pride in delivering a quality product."

Adel Jones reinforces the view that "respect for people" is a prerequisite, "Healthcare is such a people based business, we have to focus on behaviours as everyone can impact on the patient experience (good or bad). One of the challenges is that what is "waste" in the direct care of patients is sometimes based around individual preferences and to get everyone's buy-in can be difficult. We are continuously looking at new ways to engage staff, but it shouldn't be a surprise that one of our most successful interventions when commissioning redesign is listening, through listening events. A key focus now is to give them control to enable them to fix the things that they can do themselves."






There must be an appropriate balance between embedding tools and the associated behaviours or between processes and people. Process improvement without paying attention to the people and organisational culture issues will lead to a robotic adoption of proposed changes without substantial commitment to them. Suiko believe that to embed exceptional practices, it is more about changing mindset than tools (think 80:20), developing a culture which encourages enabling BEHAVIOURS. Self discipline and ownership are key attributes for everyone, for it is this that maintains the processes' sustainability.

A successful lean culture needs a methodology which emphasizes developing the right behaviours not simply deploying more tools; doing things at the right time and in the right order. For many, the tools will often have been tried before so it is not about reinventing the wheel or introducing a new technique, but instead, it is about getting the wheels back on a bus which is driven by an involved team.

LINPAC's Mike Salkeld explains that "Within LPOS "lifting the game" of the organisation is about combining the "best of best" practices, which we encourage through many channels including our best practice community, business briefcase and sharing events. It encourages a consistent approach, starting by ensuring the basics of operations management are right and are in control. Once achieved, it is then possible to drive effective and proactive improvement."

At Suiko the "what" aspect in a CI journey describes the phases an organisation progresses through on its journey to excellence. The rate at which a business moves up the levels will vary and will depend on the pull that is created to make the change happen. The top tips below, act as a prompt to challenge people to think about what is important.

Diagram 1: Suiko What™: Levels 1-5 top tip

Level 1	Level 2	Level 3	Level 4	Level 5
Foundation	Control	Improve	Optimise	Excellence
				
Measures & targets	Drive Measures	Top 3 issues	Self disciplined	Self sufficiency
What's in my area?	Go See	100 year fix	Capable proceses	Protective and adaptive
What am I expected to do?	Challenge and action	Make it visual	Step change	Create and exploit opportunities

Internal view
Reactive
Control costs



Proactive



External view
Strategic
Enhance customer value

Salkeld reflects “We had some faltering starts where we focused too heavily on doing tools rather than putting it in context and asking when to use and why. We learnt that when the TOOLS & TECHNIQUES are used appropriately it helped us to see more clearly, measure, focus, problem solve and collaborate and created the pull for knowledge.” Similarly, Lloyd emphasises that he is not a “tool head” but does see the value in having a common language and applying standard work to “tool application” in both the manufacturing and support processes.

“ The programme must be driven; management need to apply energy and attention to the critical activities to make it happen!”

Many of the tools in the lean toolbox have a common theme which is linked to the process of problem solving in order to improve performance and exploit opportunities that may previously have been hidden. The pace at which an organisation can adapt to rigorous and effective problem solving will depend on many factors and starts with the leaders, leading from the front and by adopting and using themselves the principles of effective problem solving.

Arguably, embracing problem solving is the biggest win organisations can get in the short term; mobilising their employees to better utilise their innate knowledge and expertise in their processes, it's about adopting the right mindset. Richard Lloyd builds, “Developing each individual's capability to lead the full problem solving cycle will take time, but getting everyone

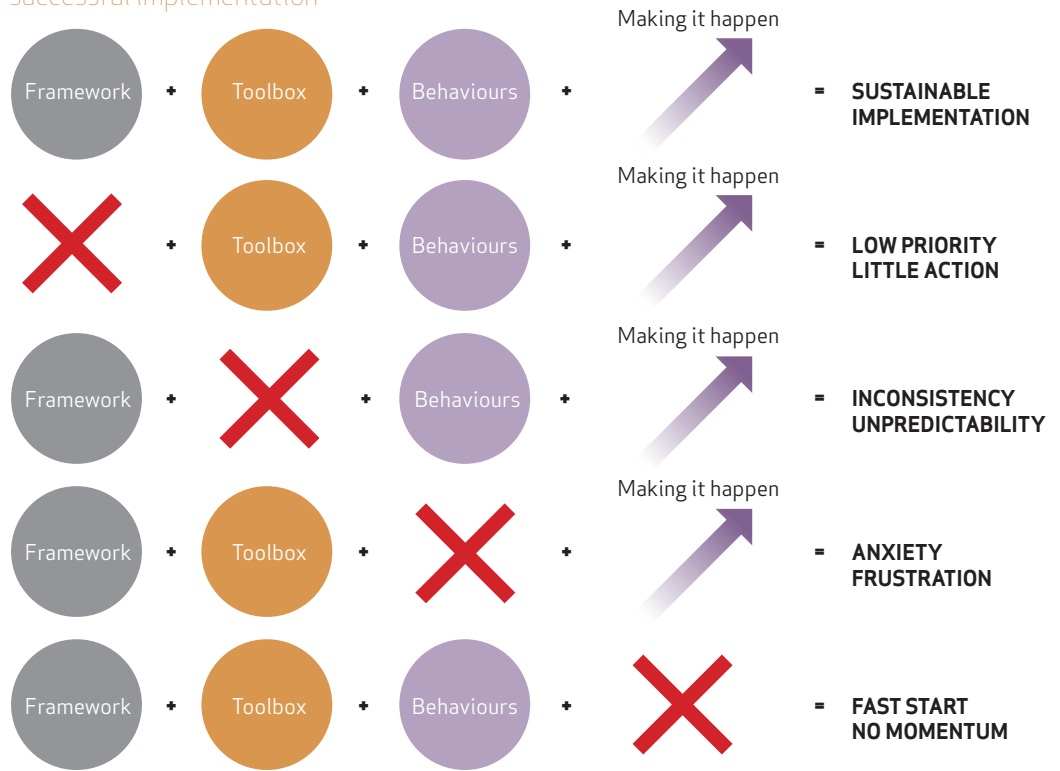
involved in the basics was encouraged from the start. We have tried to embed the 3 Cs (concern, cause and countermeasure). For more complex problems we have adopted a standard method, the A3 management process, to help provide rigour and make it easier for others to support coach and challenge.” He continues “With any of the tools, it is key to be able to choose the right ones for the job, applying a few things well to make a real difference. Being prescriptive with the approach makes it predictable, repeatable and easier to support and coach.”

How? Successful implementation of lean thinking depends on the organisation's ability to develop an holistic approach, incorporating process understanding with employee engagement. The output of this will result in an integrated, joined up programme that will lead the organisation on a sustainable and common journey to operational excellence, bringing together all initiatives into a one team, one plan approach.

A clear strategic framework that is aligned to the business vision and sets out the roadmap for the journey is essential. The framework will help to direct focus and should provide guidance for what needs to be done. The programme must be driven; management need to apply energy and attention to the critical activities to make it happen. This requires robust programme management and includes activities such as governance, tracking and strong change management.

To mobilise the organisation and ensure that operational excellence is embedded in its widest sense requires a balanced approach to implementation, with each element of the approach running in parallel. As the diagram below illustrates to fail on one or more of the elements of the approach will lead to a suboptimal programme. Recognising this risk at the start of the journey will enable management to mitigate the risk of failure.

Diagram 3: Suiko How™, a balanced approach - all the elements must run in parallel for a successful implementation



In most cases the tools are easy to understand and readily available, but getting them embedded into “the way we do things” is more difficult. Most of the change effort will need to go into influencing the behaviour change and deliver the expected results.

In the current climate, for many organisations that are in the process of implementing new “ways of working”, there will be the inevitable challenge around whether the business is following the right path as the sense of urgency quickens. It is right for businesses to remain prudent; however it is also arguably the most opportune time to adopt lean and implement operational excellence. It is critical that people do not go for shortcuts and miss out on the important enablers. If driven appropriately, even in this downturn, a company can gain competitive advantage and emerge as a more capable player. Capability to respond quickly to the upturn will set companies apart. **END**

Paying tribute to Lean Systems thinking –

Understanding Demand in Financial Services

Jacob
Austad
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Denmark



This article studies a lean project within the debt collection department in Dutch financial services and focuses on studying demand, identifying “failure demand” and establishing a useful system purpose that will support the work of employees and create customer satisfaction.

Anyone who has dedicated time to a lean initiative or drive for efficiency improvements knows cost is not on activities but in flow. However, despite this knowledge we constantly see projects initiated to focus on elimination of activities in the hope that this will minimise costs, without any real appreciation of the purpose of the work being carried out. The consequence of this being that the promised cost reductions never come through and the new processes cannot be sustained.

The root cause to this problem is that we tend to forget to see organisations and processes as systems and instead focus on one or two areas where, according to the functional organisational chart, we think we can do some good.

When this project started the debt collection system in the example company was characterised by the pursuit of as much of the outstanding debt as possible with the least possible cost. The debt department’s eight employees are responsible for the entire process and financial result.

In a traditional lean manufacturing environment projects will begin by looking at the processes and measuring time, efficiency and effectiveness and attempting to create standard work. In the service and administration environment we

are currently studying we began by trying to understand the system purpose - from the perspective of the customer. This understanding is vital since it is the only way to ensure we create the right focus for company work. It is to no use doing the wrong thing right!

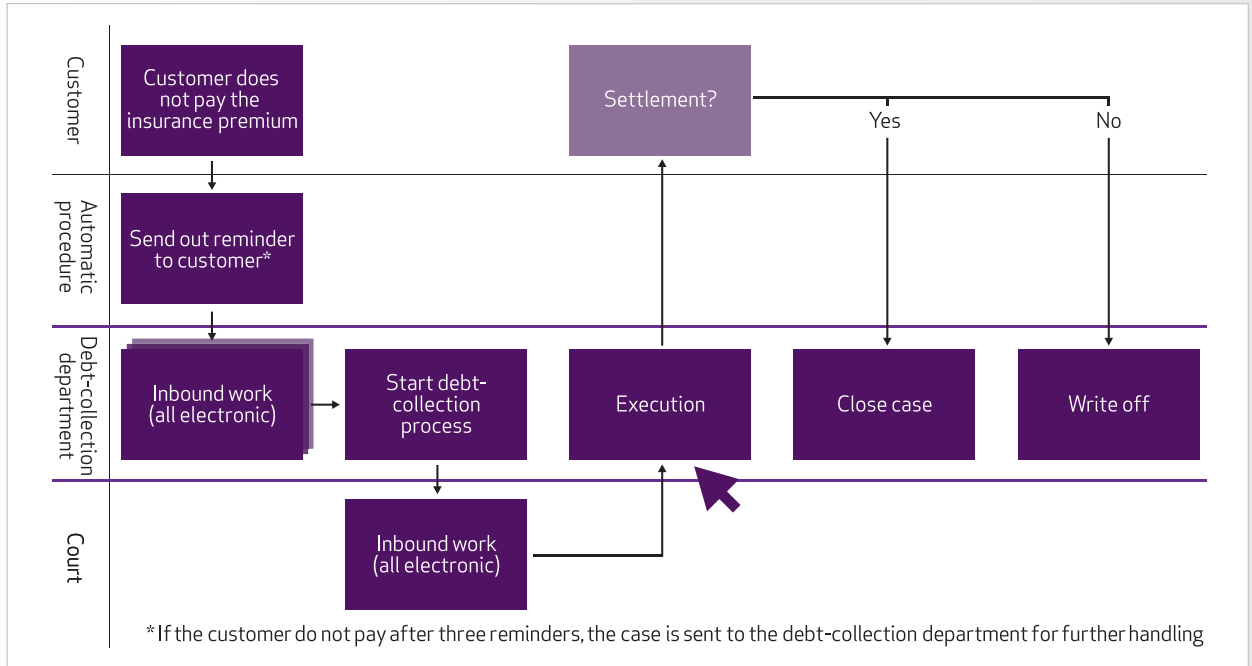
In understanding the system purpose it is essential to have a clear view of demand and to be able to answer the essential question “what are the problems customers turn to the company to get solved?” Studying demand will reveal if the work system is designed to solve the customer’s problems or if the system design actually creates unnecessary work providing no value to customers.

To understand demand you need to appreciate the difference between Value Demand and Failure Demand as defined below:

Value demand: Demand from the customer to help them solve their problem.

Failure demand: Demand caused by a failure to do something – or do something right – for the customer.

To help the reader understand the flow of work at our insurance company the following diagram highlights their work system and shows work triggers which stimulate demand.



In this particular case the majority of demand entered the company from the following three channels (not inclusive of ongoing cases which, although important, will not be addressed in this particular study):

1. IT-System (automated demand)
2. Correspondence- in the form of letters and email
3. Telephone

The major cause of failure demand for our insurance company is generated by the IT-System. This system automatically generates cases for debt collection after a customer has failed to respond to three payment reminders. From systems perspective this creates 100 per cent failure demand from the IT system since all cases are generated after three instances of contact with the customer which make no positive impact on resolving the customer's problem. The result of this kind of failure is a system which is not focused on the customer needs i.e. to pay their premium and receive insurance, but rather on the

company's need to collect debt- Hardly a situation likely to encourage customer loyalty or sustainability for the company. This problem can easily be solved by ensuring that customers are contacted directly at the first issuing of payment reminders instead of reliance on the automated prompts and waiting for the debt situation to escalate. Every company (no matter what business they are in) knows – or should know – that it is far more expensive to gain new customers than retain existing customers. This is especially important within the insurance business because revenue per customer significantly increases after three years “partnership”

Regarding correspondence: all correspondence received by the department was analysed and some of this came in the form of letters, however, in our day and age the large majority was accounted for by email. The correspondence included communications between different departments, customers and collaborators; all of these entered the department through a common inbox.

The major problem revealed with correspondence was the unnecessary trail of repeated communications back and forth asking and answering questions which could have been addressed in the first instance. Enquiries with the employees in the debt collection department revealed that they knew some of their answers would provoke another question, but because of lack of time they chose to limit their answer to the specific asked question (a particularly common approach in intra-departmental communication within the company).

“ According to the study only five per cent of received e-mails can be categorised as value demand. The rest rating as failure ”

According to the study only five per cent of received e-mails can be categorised as value demand. The rest rating as failure. Unnecessary work which does not provide value in the customers' eyes.

The above situation is a clear expression that inappropriate systems conditions are in operation due to a work culture which is focused on company needs and which rewards apparent industry over effectiveness. Employees handling high numbers of cases are considered to be more productive than those handling less – regardless of whether how many cases are being solved.

The third channel for incoming demand was phone calls. Before starting of the project, the employees believed the amount of phone calls coming in every day was very high and a significant factor for stress because of the constant “disturbance”. The studies of incoming phone calls are interesting because they clarify what the customer's ask for when contacting the company. It was revealed that 44 per cent came from customers keen to arrange for

the payment of any money owing in order to maintain their insurance, a statistic which clearly negates the latent assumption behind company purpose; that customers being approached by the debt collection department were unwilling to pay their premiums. An assumption which existed in the company due to a lack of end-to-end vision and insufficient knowledge of the customer's case prior to its arrival in the department.

A common approach to the issue of improving customer satisfaction is to institute questionnaires, interviews and focus groups which survey customers, however, the success of these surveys often proves to be limited because the questions asked relate to the companies “believed view of the world” and not necessarily to the customers' requirements or perceptions.

The systems thinking approach is to start by LISTENING to what customers say, as opposed to ASKING. This can give you valuable knowledge about how the customer's experience and perceive the service being provided. As part of this lean project the manager and employees undertook training on studying their work and implemented the following rules when answering calls:

- **Take a note of what the customer said as an introduction to the conversation**
- **Listen to the rest of the call**
- **Take a note on how the conversation ended (did the customer's problem get solved?)**

As a result of this the satisfaction of customers making calls increased - but more importantly, due to a heightened perception of the purpose of the work, employees reported that the level of incoming calls actually significantly decreased since far more problems were resolved at first point of contact.

The results of the study are shown to the right:

TELEPHONE INTERNAL AND EXTERNAL

Demand Internal

- Please tell me if this customer has paid her debt
- What is the status for this case
- Please stop the debt-collection process for this customer

Demand External

- I would like to pay, but can't until next month
- Could you please give me documentation for the debt
- Can we make an arrangement
- I have already paid and would like a receipt
- I will pay tomorrow
- You forgot to give me all documents in this case
- Why the f... should I pay this?

Value Demand

- When we help the customer sort out a concrete problem

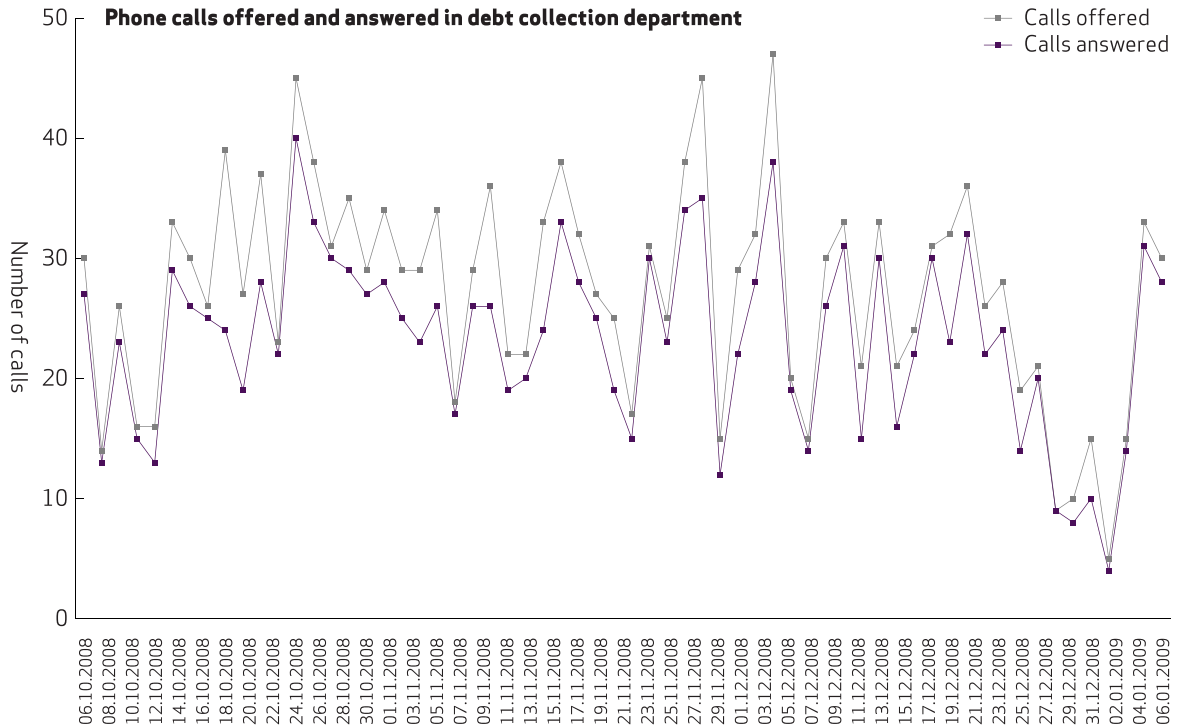
Failure Demand

- All internal demand
- Phone calls for lawyer asking for further info
- Customers complaining

Analyse

- We listened to 109 phone calls over the period of 1 week

The run chart below shows the amount of incoming phone calls for the period October 6th to January 7th



Based on the sample size the team conclude that:

Value Demand – 34 per cent of all incoming phone calls **Failure Demand** – 66 per cent of all incoming phone calls

It is clear from the above observations that the overarching problem effecting all channels of demand is that the company is employing a system which is not designed to solve the central customer problem of paying their insurance premium but instead to collect their debt when they have failed to

do so. This may initially seem a reasonable approach for the debt collection department put if their work is driven by this purpose we must ask what the impact will be on customer satisfaction, customer retention, company image, employee satisfaction and, at the end of the day, on the survival of the organisation.

Given this conclusion and the particulars of this case there are a number of things that can be done to alter the system purpose and convert work into value demand rather than failure demand. Both corporation and employees must be closely involved in the formulation of this new purpose and new methods of working.

Above all everything must be underpinned by a company purpose which is understood in the same terms by management and employees and which addresses the real requirements of the customers – not the company. Only when this is achieved can value demand be maximised for organisational benefit.

In this case immediate impacts on the level of failure demand could be made in this case by:

Following this study failure demand rates were reduced by 90 per cent overall. The most notable single area of improvement however was in the changes to the automated payment reminder system. A need to contact the customer at the point of the first reminder being sent was established and as a consequence 80 per cent of those paid their insurance premium within ten days. Furthermore the index of retained customers rose from 15 to 81.

- **changing the automated IT system which currently creates 100 per cent failure demand however this change must be followed up but a re-design of the daily processes and competencies available in the department so that they can capture the value demand available at the beginning of the payment reminder process.**
- **Focusing less on the time involved in answering correspondence and focusing instead on fully addressing the stated questions and background issues involved in each case. This would require a shift in emphasis away from the volume of cases being studied by employees as a measure of their productivity**
- **Listening to the questions or problems raised in calls and providing solutions such as flexible repayment to customers- for instance being able to pay the annual premium in instalments to lessen the one off impact on customer finances.**

According to the project team involved in this study the most significant learning was knowledge about why organisations work the way they do and when you are a part of the system it is very hard to change your view. This project has been a journey in studying and understanding the connections between daily work and the relation to the customer's real problems. E N D

(This study was based on the theories in John Seddon's model for CHECK, and I encourage the readers to read his book Freedom from command and control)

Editor Comment

"This paper illustrates the power of studying demand. The volume of failure is striking (similar to others I know) and it teaches that the current purpose (get as much money from these bad people) is dysfunctional. The design features of the system (treating demand as work to be done, managing activity, targeting revenue) were creating waste, thus greater costs and worse service the opening point about lean initiatives focusing wrongly on activity as cost is arguably worth an article in it's own right.

The key value practitioners can draw from this articles is encapsulated in the author's comments about the difficulty of establishing a truly customer focused purpose and the potentially misleading nature of questionnaires etc which "relate to the companies "believed view of the world" and not necessarily to the customers' requirements or perceptions". The author makes a crucial point about listening rather than asking in order to gain an accurate image of the service being provided. This approach is invaluable to practitioners".

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Using Factory Physics in a lean transformation



Looking at the *Factory Physics* textbook can be a trying experience and the temptation to simply shut the cover if you are not mathematically minded is understandable. However if you can absorb the fundamental principles, as the author of this article did, there is great potential to gain a new understanding of how to transform a business. This article is founded on a study within the packaging industry and was undertaken in conjunction with research for **the Lean Enterprise Research Centre at Cardiff University**.



Justin Watts,
CI manager
at Burton's
Foods

Before this project, our company had a “one size fits all” transformation model the main thrust of which was to improve throughput by continuous improvement creating a focus on making more without any real consideration of lead time improvements or improving flow. This resulted in a situation where capacity was created but no extra sales were forthcoming in the market.

The improvements to production, productivity and delivery we made during this project can all be traced back to a simple guiding statement from *Factory Physics* - “A production system is optimised at maximum throughput and minimum cycle time”. Where our business was missing the point was that higher throughput levels were being created and maintained with higher levels of WIP (Work In Progress) but with longer cycle and lead times. Lead time in any form was not being measured or used as a driver for improvement.

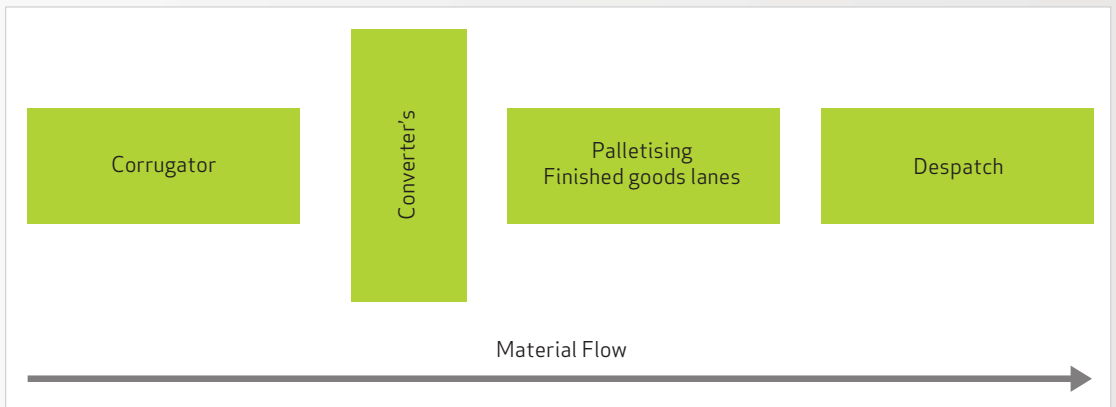
The study on which this project is based compared a lean transformation plant, considered to be significantly advanced in its program in terms of tackling process waste and variability, with another company plant which had not yet embarked on a lean program. (Hereafter these will be referred to as the transformation plant and the comparison plant.)



The comparison plant had considerably higher levels of variability and a lower throughput rate of sheets per hour than the transformation plant. At the transformation plant there had been a focus on reducing variability on the principle that it will always degrade the performance of a production line whether by lost throughput or by increased cycle time. Many people (including the author), are used to thinking of variation as variability in process rates, and that highly variable processes surely have the greatest bearing on lost throughput and longer manufacturing lead times.

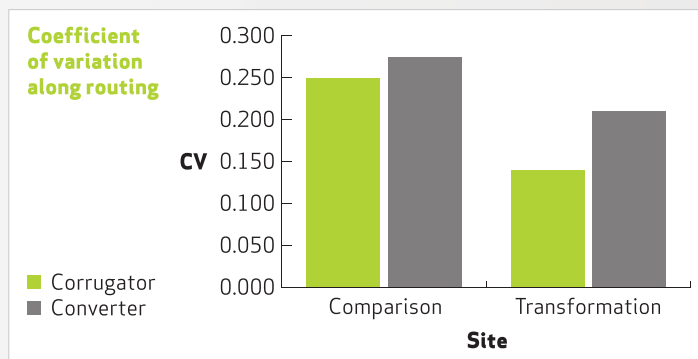
This standard thinking was challenged however when comparison was drawn between the two plants' manufacturing lead times using the example of the cycle time from corrugator to converter.

The diagram below shows the main stages of a typical paper conversion process.



Variability in process rates were measured in the comparison and transformation plants on a shift by shift basis in two ways; using the coefficient of variation from the *Factory Physics* frame work and using IMR charts.

The process variability is shown below.



The *Factory Physics* framework is a series of laws and tautologies that help us to understand how our manufacturing systems will work, they help us to understand that factories' results are determined by a simple set of rules described in the text book as "Basic factory Dynamics"

Some (not all) of the basic rules, principles and relationships that are relevant in this case study are summarized below beginning with Little's Law:

- Lead time or cycle time = work in progress/throughput
- Increasing variability always degrades the performance of a production system
- If a workstation increases utilization without making any other changes, average WIP and lead time will increase in a highly non linear fashion.
- Variability in a production system will be buffered by some combination of inventory, capacity or time. Variability, Utilisation and Time are interrelated (Basic version of Kingman's equation) called the VUT equation i.e. if you increase utilisation without reducing variability cycle time will increase.

For further reading please refer to: Hopp, W.J. and Spearman, M.L. 2000., *Factory Physics*, Inc. 2006

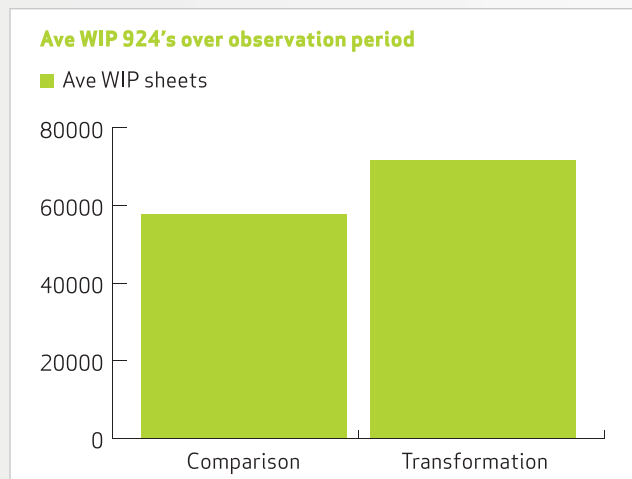
Looking at the results the first thought for the author was that the plant with lower levels of variability would have better flow, i.e. shorter and more predictable cycle time or manufacturing lead time however, this did not prove to be the case. The inset table shows that, despite its advantages in terms of variability and throughput, the transformation plant had not significantly outclassed the "non-lean" comparison plant in terms of cycle or lead times.

Plant	Rate per hour at the converter	Cycle time mean	Standard deviation
Comparison (high variability)	3601	19.64	15.75
Transformation (low variability)	5744	17.60	12.78

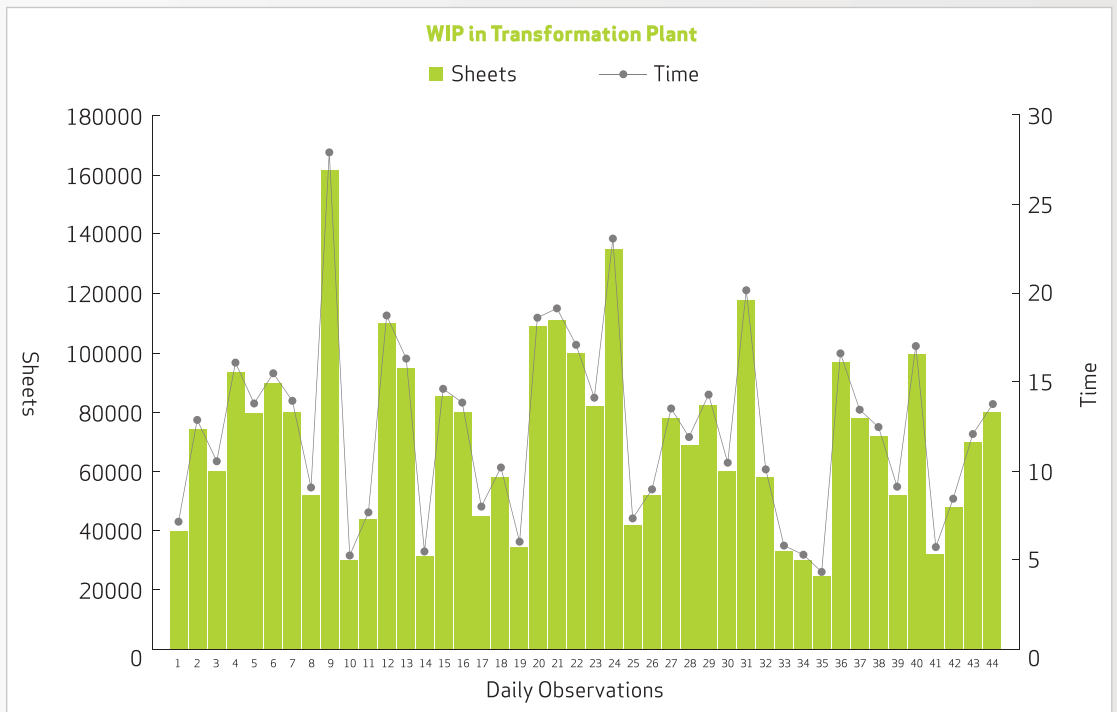
In addition neither plant had any real way of predicting cycle or delivery times since the standard deviation has high in both cases and so predictability was low.

The purpose of this article is certainly not to refute that tackling process variability is vital in a lean transformation but as the following will show, thinking carefully about flow and applying relevant measurements from *Factory Physics*, can be the enabler which allows process improvement to really come to fruition.

Since throughput in the transformation plant was higher but the cycle times in the two plants were similar we were quickly able to assume that the differentiating factor must be WIP, and indeed this proved to be the case (Little's Law).



This led to the conclusion that the WIP must be having the greatest effect on cycle time and that variability in cycle time was being added to the process by bad control and not by the process rate variability. To investigate; a daily measure of WIP was taken at random times. This can be seen below.



What we learnt was that the effect of batching at the corrugator for efficiency reasons and of arrivals at the WIP area were causing variable WIP and in turn variable flow time. This meant that flow was being affected by where in the queue a new job arrived in relation to the WIP which might account for anywhere between four and 28 hours.

To overcome this quandary we were able to turn once again to *Factory Physics* and make use of Kingman's equation. The equation simply proves that the part of the cycle time spent in a queue is determined by not only the process variation of the station i.e. hourly rate, but also by the arrival variation and the utilisation. This means that using lean tools to reduce process variation or improve OEE can do nothing on their own to improve flow.

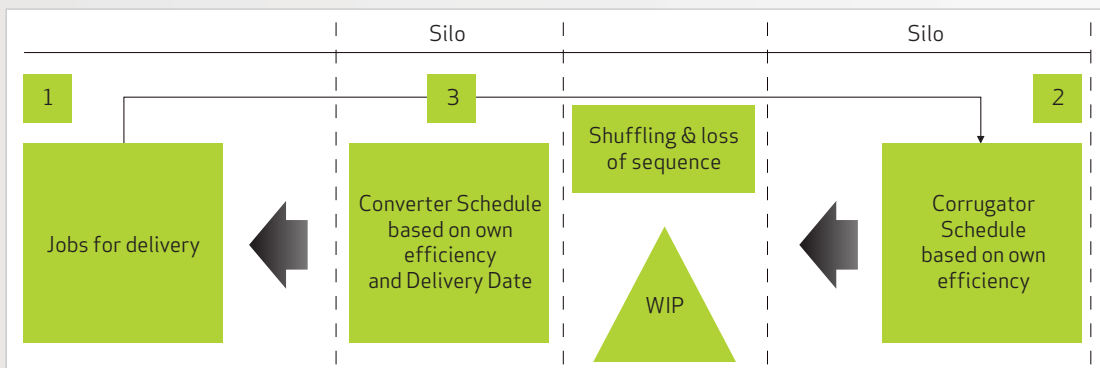
As a consequence of this thinking arrival time in the transformation plant were studied and proved to be highly variable i.e. the flow of product was very irregular. This situation was perpetuated by the internal policies and choices mentioned in the introduction to this article which focused on "making things" in isolation in a cost driven pursuit of "efficiency". As John Seddon would say, the business was guilty of "managing the budget" and trying to benefit from "economies of scale" rather than serving the customer and benefiting from "economies of flow".

Our first move in tackling flow variability was to look at the patterns we had recorded when measuring WIP. When we look at the WIP graph we can see that there are no occasions where WIP runs out and

throughput is lost and this shows that the transformation plant had successfully managed to assure a minimum WIP. However, according to Factory Physics a pull system is only as effective as the strictness of a WIP Cap. Applying a maximum WIP would reduce variability in cycle time.

Another adverse effect on cycle time was that once WIP arrived into the holding area, it was quite often shuffled out of FIFO sequence to save on set up at the converters (again for economies of scale). This increased output but also increased cycle time.

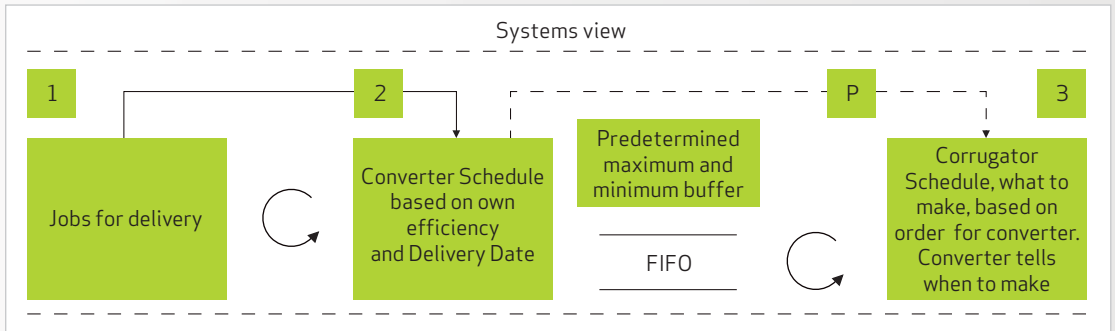
This sequencing logic can be seen below. 1 refers to the first phase in the logic of scheduling the plant. This started with the customer order, which prompted production to begin at the machine with the highest running costs followed by production finally moving to the bottleneck despite the fact that as this step controls the out-put of the system the WIP area will be disrupted and the FIFO system will have to be shuffled out of sequence.



The *Factory Physics* framework tells us that variability will be buffered in some way by inventory, capacity or time. The variability in cycle time; caused by bad control rather than process variation or unreliable machines was having a major effect on the plant, preventing them from being able to predictably forecast final delivery and therefore leading to an undesirable situation where customer lead times were manually increased as a safety buffer against the unreliable flow. Predictably this situation was compromising both customer satisfaction and the competitive potential of the company.

The transformation plant's delivery dates, as in all MRP systems, were based on average move times and process times. It also emerged that no queuing time was included in the calculation for delivery dates and as most time was spent in a queue, delivery dates were always wrong.

To counter this bad control and improve flow an alternative sequencing logic was proposed. In addition to the use of Drum Buffer Rope principles and to protect the converter with an unlimited amount of WIP, the major change was the addition of a WIP cap between corrugator and converter. The new sequencing logic is shown on the next page.



In this diagram the logic is still instigated by the customer need or order however the next step is to schedule the running of the bottleneck which controls out-put. The third step is then to allow the corrugators to supply the converter at need. This keeps WIP in FIFO and facilitates flow through the whole work system.

Using this sequence allowed the plant to;

- Hold WIP as constant as possible by reducing arrival variation, instituting a cap and running FIFO
- Reduce Manufacturing lead time and make it more predictable thereby reducing the time buffer on customer lead times and reducing total lead time.
- Further work to reduce the buffer and WIP without losing throughput.
- Increase responsiveness.
- Encourage customers to order correct quantities and closer to the required time.
- Increase the business's competitive edge.

These changes to the physical and policy choices of the plant were supported by measures and performance management in the scheduling department. Daily reviews are held at a visual performance board which displays lead time, manufacturing lead time, Average WIP, occasions over WIP max, lost time for no material at the drum. The traditional measures for gaining low process variation were not erased but took on a

lower priority. The frame of reference for lean in the transformation plant changed from focusing on throughput and machine efficiency to focusing on delivery to the customer. A goal to cut lead times by 50 per cent. This significantly increased the competitive edge of a company which was already an excellent business in terms of process efficiency.

What the experiences of this research prove is that variability is the key factor in designing a lean transformation path and has confirmed to two clear levels for lean implementation.

Adding the following aspects to a current state analysis will enable a greater level of understanding:

- Measures of manufacturing flow time,
- Coefficient of variation for process rates.
- And an analysis of variation in WIP levels (arrivals).

We have learnt that by identifying and diagnosing the greatest sources of variation in a production system, and measuring their impact on flow, lean transformation can be taken to a new level which is not attainable using traditional tools alone. **END**

Editor Comment

It is excellent to see systems thinking in lean being applied to reducing lead times and potentially increasing customer value. The technicalities of this subject are not easy but the outcomes demonstrate what an important area this is to come to grips with.

Managing lean replenishment

In the following article Sami uses theory and example from Jabil, a major client and international contract manufacturer, to highlight the pros and cons of “push” and “pull” inventory replenishment systems.

Whilst acknowledging that lean implementation is predominantly a people and culture based process, **Sami Cassis**, product management director at SAP, is a strong advocate for the support that integrated supply chain management systems can give to lean enterprises.



Until recently supply chain software has relied largely on a “push” approach for inventory performance predictions. For some, including manufacturers working with build-to-order environments or for those with complex manufacturing processes and with several material and capacity constrained sub-assemblies to be synchronised, an advanced push system remains the best option. However push systems can be complicated. They rely on complex estimates of projected demand which have been reliant on fluctuating customer needs and have limited ability to compensate for dramatic changes in market performance and cancellations. Overly optimistic forecasts can therefore impact negatively on inventory, even in a well-managed push process.

More recently a range of “pull” systems have appeared in the supply chain software market response to new demand from an increasingly mature lean culture in manufacturing beyond the confines of the automotive industry. It is possible to

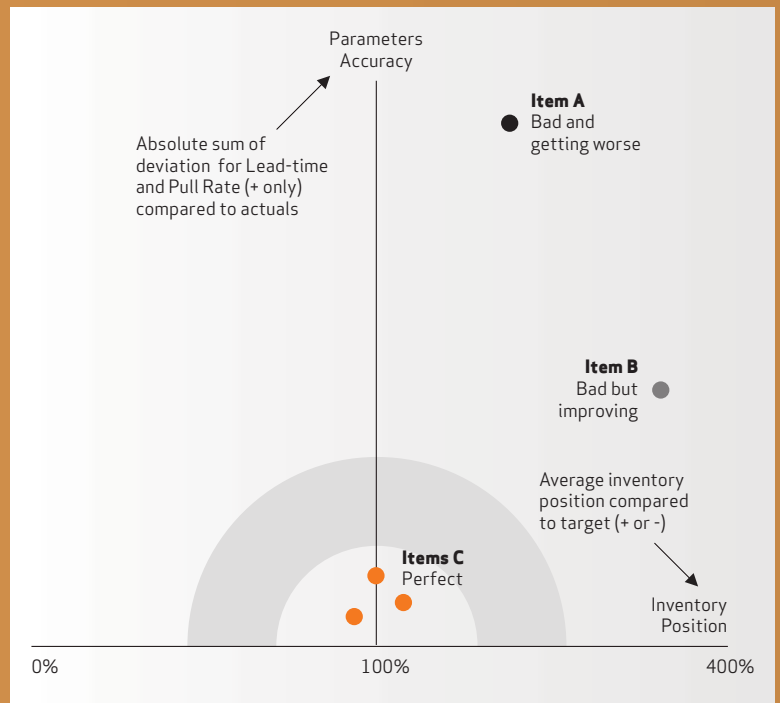
argue that the new pull systems recently developed by SAP and some others do not represent “pure” pull systems in the original Toyota sense however, short of carrying a lot of just-in-case inventory, a pure pull system based on instinctive reactions fails by design. Buried into its 98 per cent customer service level is a 2 per cent expected failure to meet demand. In the case of highly variable demand chains, that failure always takes place at the peak of the demand curve (i.e. marketing campaigns, events induced demand, seasonal demand, etc.), substantially impacting revenue and margins. In developing their pull supply chain software SAP have attempted to address this problem through introducing triggers which can respond to one-off events and adjust the system buffers accordingly. These triggers act as occasional “sensors”, they are created by monitoring overall demand within the lead-time. Whenever the number exceeds the total number of Kanban, an inventory shortage becomes imminent. A batch of Single-Use Kanban (SUK) is then released to raise inventory and avert shortage. SUK, being actions

triggered by future demand, are push processes in the middle of a supply chain otherwise “pulled” by lean pull concepts.

Pull systems have much less dependency on projected demand than push systems and are much simpler to manage. A pull system automatically replenishes the exact amount of inventory consumed in a given period of time, limiting guessing and risk by implementing buffers dependent on average future demand and replenishment lead-time - This approach dissipates the risk of dependency on discrete projected demand by replacing it with replenishment triggers corresponding closely to actual consumption. The result of this is that the accuracy of pull systems over months and quarters is much higher than that in push systems, relying as they do on daily and weekly demand calculations for replenishment generation.

For “on-target” average inventory, all that is needed for a successful pull system is a good estimate of average demand and lead-time. That is the biggest edge held by pull over push systems. Poor inventory performance in a pull environment can only be attributed to an error in average demand or average lead-time and not to the manifold and dynamic nature of changing demand over time. By tracking and adjusting the performance of these the average parameters, the outcome of a pull project can be progressively enhanced to reach its expected objectives.

The X axis represents the inventory performance of an item as compared to target -the centre represents that target. The Y axis represents the absolute sum of the parameters’ error (i.e. absolute error in average demand + absolute error in lead time). Mapping an item on the chart provides information of its inventory performance as it relates to its parameters’ accuracy.

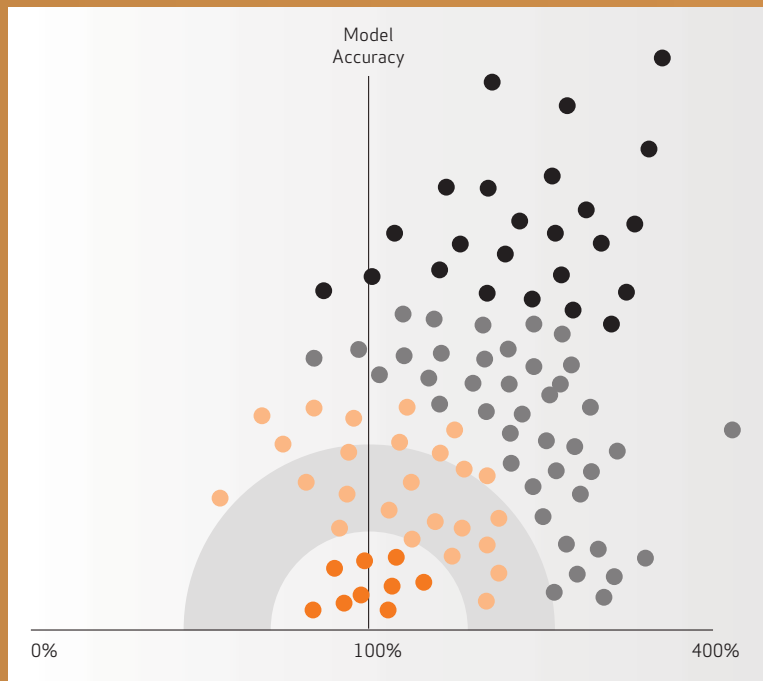


There are several ways to do this; suitable analytics and report generation systems are a plenty and the inset graphical images provide examples of effective performance tacking systems which highlight in the “big picture perspective” way in which “pull parameters” relate to the accuracy of the system as a whole.

Mike Dantuano, sr. director of supply chain operations, and John Foster, director of IT, supply chain Management at Jabil explain the reasons for their choices of software to enhance their inventory strategy.

The decision to adopt push or pull methodologies depends largely on the

Mapping all the items in a given location provides a macro view of the performance and allows for focus on the most problematic items. A simple glance at figure 1-b highlights the fact that although 30 per cent of the items are performing well, many have incorrect parameters and consequently poor inventory positions. This figure also shows that the majority of items have higher inventory than required, with very few having lower inventory.



customer needs, Jabil offers both push and pull based replenishment processes.

The performance of a consumption based pull method as stated in the previous section is dependent on accurate macro representation of demand. The main issue with this is that in a true pull process this will be an average based on historical consumption and, as economic environments swing up or down, this will lag behind the directional nature of the business.

Jabil has enabled pull based management processes that address this issue and allow for projected directional changes in the business while maintaining pull logic. The primary focus in managing business engagements in this model moves from forecast mix management to:

business environment. Certain aspects of both processes have inherent positives and negatives that must be balanced. Key considerations in determining which may be most appropriate include: product life cycle, purchased material lead times, product mix and forecast accuracy. When forecast accuracy is low, pull logic is a viable option; delinking the reliance on the forecast to generate a Master Production Schedule (MPS) and manage supply based on Material Requirements Planning (MRP).

In 2006, the EMS division of Jabil, under pressure from key customers, initiated a project to support demand-driven or pull replenishment. Today, depending on end-

1. **Better understanding the macro level demand projections**
2. **Gaining visibility into end-customer consumption patterns**
3. **Driving shorter component lead times by working to enable the same pull logic in the downstream supply chain and reducing the total inventory exposure throughout the supply chain without sacrificing customer shipment needs**

While both pull and push methods can be successful, Jabil has realised significant benefits as a result implementing pull models, particularly during recession. Major benefits have been:

1. Inventory levels during recession did not rise as is typical in a push model
2. As demand stabilised and increased, inventory correction was rapid and significant -Days Of Supply (DOS) reduced by nearly 40 per cent

The key to success comes from understanding the overall business climate and maintaining event-based execution signals to reduce overall inventory exposure. In order to maintain this event-based process, Jabil has enabled systematic triggers within its integrated system to allow for unique events such as large customer orders, short-term demand spikes and manufacturing plant transfers, to be managed effectively. As ever, the crucial consideration when implementing systems of this kind, is that internal IT, supply chain and manufacturing organisations are collectively engaged in determining the best course of action and that design and execution needs are aligned. **E N D**

About SAP

SAP is the world's leading provider of business software, offering applications and services that enable companies of all sizes in more than 25 industries to become best-run businesses. For more information, visit www.sap.com.

About Jabil

Jabil is an electronic product solutions company providing comprehensive electronics design, manufacturing and product management services to global electronics and technology companies. Further information is available on the company's website: jabil.com.

Editor Comment

"Considering the longstanding neglect between software developers and the lean community it is therefore refreshing to see SAP's attempt to embrace the principles of lean thinking and I hope this article will instigate discussion amongst the lean community on how to integrate principles of "flow thinking" into systems development.

For me this article has raised key questions in the following areas:

- **Demand distortion is the enemy: The pull system described in this article could dampen demand amplification to a good extent but the question remains - how do we eliminate demand distortion? Arguably, firms using this system still pass on unnecessary changes in demand to suppliers and/or receive noise from their customers.**
- **Adopt an holistic approach: Lean needs to be a systemic approach beyond JIT or pull signals. Although, a common manifestation of lean is pull, fundamental to creating a pull system is understanding demand for type, frequency and fluctuations.**
- **Systemisation of a process containing waste generates "systemised waste": We are undoubtedly in need of systemised solutions however it is unfortunately in human nature that we often forget why we have implemented a system and what its original design purpose was. This leads to taking system procedures for granted and creating inappropriate drivers for inappropriate behaviours. This is certainly not the developers fault however, as users we need to dare to question the "why and what" of systems.**
- **Pull is "one way" of maintaining flow: There is avid debate in supply chain management over the relative advantages of push and pull systems. I dispute the idea that (according to lean evangelism) there is any value in a push system. The fact is that it is something we simply have to put up with day to day in our software (even Toyota). I believe the "pull vs. push debate" could be barking up the wrong tree. The key issue is managing the end-to-end flow and extending it as far as we possibly can".**



LERC's John Bicheno reviews: **Schonberger, Richard, 2008, *Best Practices in Lean Six Sigma Process Improvement: A Deeper Look* (John Wiley and Sons, Hoboken, New Jersey. 290 pp.)**

Richard Schonberger is, of course, one of the “original gurus” of what is today called “lean”. Having written the influential 1982 book *Japanese Manufacturing Techniques: Nine Hidden Lessons in Simplicity*, and a regular stream of books ever since, he has remained at the forefront in this field through almost three decades and several name changes – world class manufacturing, lean, and now lean joined by six sigma. This latest work will not disappoint Schonberger’s large base of followers, amongst whom I certainly include myself.

Best Practices is presented in six parts that examine some fundamental questions – including: Does Lean beget financial success?; How has improvement gone wrong?; The weak spots of impressive companies and the changing landscape of Lean. These are important and difficult questions that both academics and senior managers should be seeking answers to. Does he answer them? Well, he gives them a good shot.

As for six sigma, there is little direct material on this topic in the book. Although today many leading organizations have lean six sigma or lean sigma programmes in place, their integration remains an open issue that best practices do not resolve. So, the book is about lean practice, not

six sigma. But, his remarks on six sigma, emphasizing collecting data in real time “at gemba” by direct observation fit in very well with Steven Spear’s recent book, *Chasing The Rabbit*. This is a welcome change from the sometimes overly statistical approach presented by several authors on six sigma.

Throughout the book, Schonberger offers speculation and sometimes explanation for inventory turn trends displaying a breathtaking knowledge of many industries.

Schonberger followers will be rewarded here with many practical gems and warnings. In a snappy question and answer style which frequently shoots down widely-held beliefs. For instance, he warns about future state value stream maps becoming a set of numeric goals rather than focusing on process improvement, insights into capacity utilization and the importance of some under-utilization, and observations on counter-intuitive plant layout. The chapter on metrics – with comments on the “hot” topics of lean accounting, measures, and misguided OEE – is a section that alone justifies purchase of the book. He continues a theme that he has discussed in several previous books – that good design is a huge source of competitive manufacturing advantage, that is recognised still by only a few. On this, again bucking much current opinion, he says that the West has a distinctive lead over Japan.

Some may not like his views; some may criticise his attention on inventory turns being a partial view and too lengthy. But that is classic Schonberger – always challenging, never following the lean six sigma party line, but always seeking new insight. **E N D**

EVENTS

There are currently an expanding pool of events available for the development of the lean community which offer both general and sector specific opportunities to renew your enthusiasm and gain new perspectives through communicating with lean contemporaries.

Included amongst some of the most ambitious new enterprises is the new Public Sector Lean Forum recently launched by LERC and supported by LMJ. This forum, which was launched at a Think Tank in Bridgend on 12 October, will soon be followed by further connect events – look out for further news on how to become involved.

Other forthcoming events at LERC and other lean institutions include:

LERC, Cardiff University

Lean & Green course: 22 October

This new 1 day course explores the relationship between lean thinking and green environmental issues and trends. Lean thinking is growing beyond the conventional “efficiency areas” and managers and management thinkers are realising that the real strength of lean is challenging thinking rather than delivering tools or off-the-shelf solutions.

Lean, therefore, has great potential beyond the economic arena.

For more information visit: <http://www.leanenterprise.org.uk/content/view/248/259/>

Lean Leadership course: 19–21 October

Now LCS Accredited, this new 3 day workshop designed for senior staff as a major stepping stone on a journey to creating a lean enterprise in their own organisation. It draws on the results of LERC’s “SUCCESS” research project, which examined the ingredients for successful and sustained lean transformation.

For more information visit: <http://www.leanenterprise.org.uk/content/view/217/231/>

Lean supply chain course on 5–6 November

A hands-on two days executive course to help you on your journey to reduce value chain costs and combat the recession. As consumers tighten their belts and become more discerning, time is right for renewed attention to supply chain costs and opportunities for value enhancement. The Lean Enterprise Research Centre is world authority in lean thinking. We have worked with a wide range of leading firms in different sectors to deliver huge improvements.

For more information visit: <http://www.leanenterprise.org.uk/content/view/253/265/>

Lean Accounting course on 25 November

Lean Enterprise Research Centre presents a 1 day course that offers a lean perspective on traditional accounting methods, illustrating how lean accounting techniques can lead to increased profitability and productivity. Suitable for senior production and operations managers, lean practitioners, finance directors and controllers.

For more information visit: <http://www.leanenterprise.org.uk/content/view/62/128/>

Vanguard Consulting Systems Thinking in Wales: 11 November, Cardiff.

For more information visit: info@vanguardconsult.co.uk

The Manufacturer: The Manufacturer Directors Conference 2009 – 12 November

Find out how lean is developing and how it fits with parallel business strategies in the new manufacturing age. For more information go to www.themanufacturer.com/directorsconference

Systems Thinking in Northern Ireland 3 December (a.m.), Belfast

For more information visit: info@vanguardconsult.co.uk

Warwick Manufacturing Group Business Process Re-engineering Workshop: 17 November and 15 December, Warwick

For more information visit: <http://www2.warwick.ac.uk/fac/sci/wmg/about/events/>

LMJ will be media partner for the IQPC Process Excellence Awards and Summit 26–29 April 2010, London – Attend the event and receive special subscription benefits!

