



CODEXX WHITEPAPER

The Lean Manufacturer – a rare beast

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Introduction

“People don’t go to Toyota to work they go there to think.” Taiichi Ohno

The quote from Taiichi Ohno, the co-creator of the Toyota Production System (TPS), can be taken with a pinch of salt as the evidence of Toyota’s productivity is that employees certainly do work, in fact they work very hard indeed. However it is just a small pinch, as Toyota employees clearly work smart as well as hard, as shown by the level of effective employee involvement in their continuous improvement programme. They achieve an average of 10 implemented improvement ideas per employee per year. In contrast, Western manufacturers struggle to achieve an average of 0.1 implemented ideas per employee per year – a hundredfold difference. Of course continuous improvement is one key part of the Toyota Production System – its variant of Lean Manufacturing – which has been the fundamental platform that has enabled Toyota to produce high quality, low cost cars that have propelled it ahead of the established US automotive manufacturers to become the world’s biggest car maker. Toyota has successfully sustained and indeed grown its Lean practices over the years to achieve massive benefits to its competitive capability. They have shown the power of Lean.

Over the last two decades the authors have worked with many manufacturers who have sought to become ‘Lean Manufacturers’ and gain the benefits illustrated by Toyota. Given that the philosophy and techniques that make up lean have a 50 year history and have been well communicated, surely there can be no secrets about what lean is and what is needed to achieve it? Well, if this is the case:

- Why are there so few truly Lean manufacturers?
- If Lean is really just a set of simple tools, why is it so hard for manufacturers to establish and sustain a lean culture and see real bottom line benefit?
- What are the few key things companies must do to achieve lean success?

In this short paper, we aim to answer these questions.

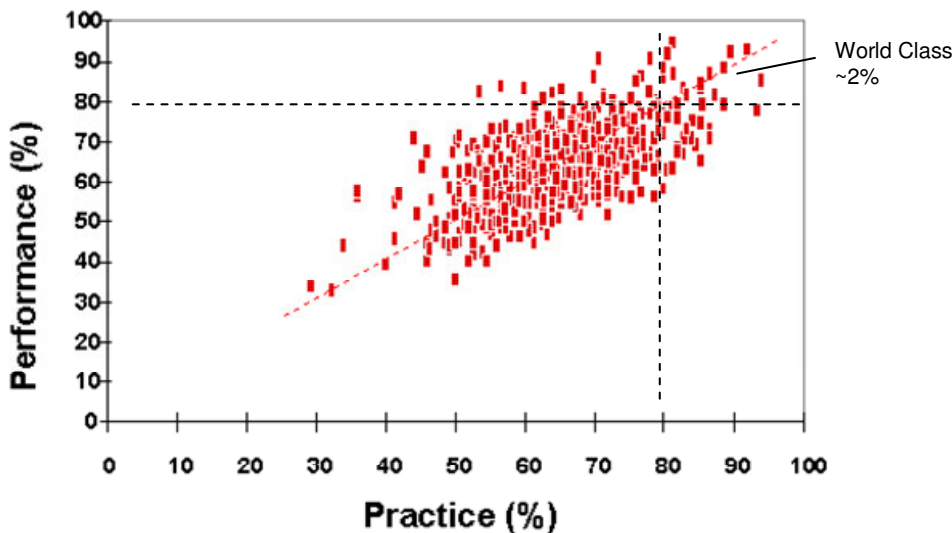


Figure 1: Benchmarking shows less than 2% manufacturers are truly Lean

(Source: CBI, Comparison International Ltd)

Where are the *truly* Lean manufacturers?

Truly Lean manufacturers are few indeed. And we can actually quantify this. In 1992, IBM and London Business School developed and launched the PROBE manufacturing benchmarking tool, built around a model of best practices based on Japanese Lean manufacturing techniques. This benchmarking tool is now operated by the CBI (Confederation of British Industry). Between 1992 and 2009 over 2000 manufacturing sites were benchmarked against it – providing a rich database of information. Examination of the overall results shows that less than 2% of the assessed manufacturing sites are at a world class level – or in other words: Truly Lean. In our work with manufacturers we do find many instances of lean excellence – but this is typically in islands within a larger archipelago of ‘fat’ production practices. Factories with lean as the dominant working practice do exist, but they are very rare. Why is this so?

Lean is not new – the expression ‘lean production’ first appeared in 1990, but even then only to encapsulate what appeared to Western observers to be a radically new approach to manufacturing that had evolved in Japan over the previous 40 years. The philosophy and techniques within Lean were developed by Toyota from the 1950s and first entered Western business awareness in the late 1970s as ‘Just In Time’, Kanban and ‘Pull Production’. Lean is still associated most strongly with the automotive industry where it originated and where repetitive, high volume manufacture and relatively long model life make it well suited to the application of lean tools. However, not all automotive companies can claim to have fully embraced lean and companies in other industries, especially those which experience greater product design variation and more sporadic demand, have generally struggled even to get started.

At best, attempts to embrace lean have often achieved little more than the establishment of some uncoordinated continuous improvement teams or ‘quick hit’ kaizen events to re-arrange areas of the shop-floor. At worst ‘lean’ has been invoked as a justification for simple, old-fashioned cost-cutting. Of course there are many examples to be found of good implementation of key lean tools such as kanban and SMED, but rarely have these truly changed the culture of the business, or even produced measurable, sustained financial benefit across the business. Success has been typically limited to a production cell, assembly line or just part of the manufacturing operation. The truth is that lean is much more than a rag-bag of tools and techniques. It amounts to a different way of thinking about the business - one that must become hard-wired into the minds of a company’s management team if it is to achieve its full potential. Why? Because unless every business decision is framed within a lean mindset, conventional thinking will keep returning and dilute the potential benefits.

Lean fundamentals – *Part 1*

The fundamental requirements of lean can be summarised as:

1. A relentless focus on the creation of customer value
2. The elimination of anything that doesn’t contribute to customer value
3. A culture of continuous improvement

This sounds straightforward, but there are very good reasons why lean required a 40 year gestation period before it delivered its full value to its parent Toyota! It is worthwhile examining the realities behind these three underpinning ideas and why they are so challenging to achieve. But before we do this, we invite you to take a few minutes to look at your own business and consider how lean you are. The following page (Figure 2) contains a short self-assessment which will take just a few minutes to complete – you can complete it alone, but you would gain even more value by assessing it together with other members of your team.

Intermission – How lean is your business?

Figure 2: How lean is your business – Self Assessment

Assess your organisation against Lean excellence by scoring 1-5 against each question. Match the description (High, Medium, Low) against your own business. If you consider you are in between the columns you can score 2 or 4. Finally total the scores.

No.	Question	Low (1)	Medium (3)	High (5)	Score
1	How many parts of your organisation would you be happy for your customers to come and study closely for a day?	You must be joking – there is too much fire-fighting and waste around	Some areas we'd be OK, but too many are not	We are always ready for customers to visit and our production processes are in an excellent state	
2	How much of your production is produced to forecast rather than to a real customer order?	<50% (we typically make to forecast)	40-70% (we have a mix)	> 70% (we mostly make to order)	
3	How high is your OEE on your bottleneck machines?	<60% / don't measure	60-80%	>80%	
4	What are your inventory turns? (Cost of Goods Sold/Average inventory)	<10	10-20	>20	
5	Attach yourself mentally to an element of the flow through your value stream (e.g. a piece of raw material or a customer order). What % of the total elapsed time on average is value being added?	<5%	5-10%	>20%	
6	What is your On Time In Full (OTIF) delivery performance?	<90% by week	60-80% by day	>95% by day	
7	How active are your production teams in CI?	CI is not being done in any systematic way by production personnel	CI is active, but benefits are low – probably 1-2% savings per year	Achieving >5% year on year in cost down from production CI	
8	What is the main driver for your Lean programme?	We have to cut costs	In our business you have to keep improving to retain customers	We have a clear strategy for meeting our customers' needs at minimum cost	
9	What proportion of your workforce understands Lean principles and is both competent and regularly applies at least two lean tools?	<10%	20-40%	>50%	
10	How much waste do you think there is in your business?	Don't know – never checked this.	Analysis of Order to Ship shows >95% of elapsed time is waste	The more waste we eliminate, the more we find.	
11	Our lean programme is.....	A manufacturing department initiative	Understood and supported by other departments	Fundamental to every decision taken by our management team	
TOTAL				(55 maximum)	

Score	Diagnosis
>40	You are operating as a lean manufacturer. Typically your key challenges now are how to sustain Lean within your business and also to grow it further up and down your value chain to include suppliers and your customer delivery and service operations.
33-40	You have clearly established some elements of Lean within your business. You are probably finding that deploying and truly embedding Lean within the organisation is much more difficult than educating and applying the Lean tools. You must persevere, ensure your focus is clear and work to increase involvement and change behaviours – both in management and employees.
20-32	Your score shows that you have some aspects of Lean within your business, but it's very early days. If you want to succeed, you need to demonstrate success in the short term, but also prepare the business for a long journey that will transform the business. You need to ask whether management has the courage and the patience to lead the organisation through such a journey.
<20	You're reading this article so that's a start. But your organisation has little or no Lean practices in place. Perhaps you consider that Lean is not relevant to you? Even if your focus is on Agility and responsiveness, a Lean foundation is key. Without applying Lean principles in your business you are throwing money away and also providing a lower level of service.

So, what did you learn?

Lean fundamentals – Part 2

Let us now return to examining the three fundamental requirements of lean:

1. A relentless focus on the creation of customer value
2. The elimination of anything that doesn't contribute to customer value
3. A culture of continuous improvement

- and consider why they are often so challenging to achieve.

1. Focus on customer value

To achieve the total potential that lean offers for the transformation of a business there is no alternative to a root and branch review of the way customer needs are satisfied and customer value created. Every step in the value creation chain ('value stream') that links customer requirements with their fulfilment with a product or service must be organised in a logical, efficient manner, so that value is created in a seamless flow, without interruption, delay, or unnecessary movement or transportation. The value chain includes both information processing (e.g. order configuration, order scheduling) and material processing (e.g. product assembly, shipping). Any activity that does not contribute to this value stream is waste and must be challenged and then reduced or eliminated. Examples of typical activities present in many value streams that do not add value are: Order processes where delivery dates cannot be committed at point of order, where order configuration is a clunky process with multiple handoffs needed for approval and scheduling; manufacturing processes where delays are built in due to batch sizes and make to forecast rather than to order; shipping delays due to lack of visibility of product in warehouses and inefficient transport scheduling.

It goes without saying that before starting this analysis it is essential to fully understand how your company is, and could be, creating value for its customers. Are you sure that you really understand your customers' needs and are you proactive in developing innovative products and services that they truly value? Have you asked them recently? Involving some customers in this process is very valuable, yet too few companies do this readily. They typically fear letting their customers see the problems they have within their business – yet their customers experience this regularly anyway - through the service and value they receive.

In imagining a future state or 'TO-BE' vision of how the business could be, much current waste can be designed out by changing to an organisation that is aligned with the value-stream (thus fixing problems associated with hand-offs between departments). Other wastes will be identified at the design stage that cannot be eliminated immediately; these will be marked down for subsequent continuous improvement activities, giving them structure, purpose and priority.

A value chain focus implies the need for substantial physical and organisational change, focusing the resources of the business around the one or more value streams that the company delivers. It requires a challenging act of imagination to see the business as it could be, rather than the present reality. This also requires the demolition of unhelpful paradigms that exist in the business, having developed over many years (e.g. *'this is the way we do things around here'*). Unhelpful accounting systems that encourage manufacture in large batches and production for inventory are often foremost amongst these. There are techniques of Value Stream Mapping that assist this task of developing the TO-BE vision, although these are rarely applied at a sufficiently strategic level to engage senior managers in the task of truly re-thinking their business. Value stream mapping is typically only focused at the operational level – looking at part of a production line for example – rather than standing back and using it to look at the whole business value chain.

The involvement of senior management in this process is key if the full potential of value stream analysis is to be realised. It is all very well to see lean, as many do, as an empowering, team-based, problem-solving activity for those *at the coal face* (i.e. in production), but that is only part of the

story. The value chain encompasses sales & marketing, design, distribution, after-market as well as production. A good example of over-focus on production is recalled by one of the authors in working in implementing Lean in a large European site of a major global chemicals company in the early 1990s. The focus of the project was in improving responsiveness and to that end management set the goal of reducing cycle time in the paint manufacturing process by 50%, taking several days out of the process. This was tough to do, but eventually achieved. Later it came to light that the average time from when an order was placed to when it was scheduled in manufacturing was about 40 days. In reflection it would have been somewhat easier to take substantial time out of the order process than the production process...

Standing back and looking at the complete value chain is critical. There are strategic decisions to be made at the top of the organisation as to the focus and prioritisation for lean. Only then can the workforce be meaningfully engaged in the lean improvement process. Once the key customer value streams have been identified, focus can move to improving their efficiency through the elimination of waste.

2. Elimination of anything that doesn't add value

The true potential for business transformation arises in seeking to achieve the goal of eliminating non value-adding activities. In all organisations there is a huge amount of resource and cost applied to activities that have nothing to do with creating customer value. Many of these are justified as being necessary (legal compliance, health & safety) or good practice (staff development, process monitoring & data collection) and it is indisputable that many things do have to be done which don't directly affect customer value. But this can blind us to the very many things we do that are not necessary. Even tasks that clearly have a value adding purpose (e.g. material acquisition, customer order processing, even production processes) can include a great deal of wasteful activity. To quantify the level of waste present in nearly all manufacturing operations, it is useful to consider time; specifically time spent adding value to a product as a % of the total time required to produce the product. In most cases the value adding time is much less than 5% of the total time. All the rest of the time is used for non-value added activity such as testing, rework, waiting etc.

So finding waste is not a problem. Local kaizen activities generally find some waste to remove – which is not surprising, when there is so much of it about. But sporadic, random improvement activities are unlikely to home in on the most important sources of waste and often time and effort is spent on improving aspects of processes that are themselves unnecessary or sub-optimal. Frequently improvements fail to 'stick' and things revert back to the original condition, either because the improvements are seen as irrelevant when surrounded by so many other sources of waste that haven't been tackled, or because the reason for making the improvement has been misunderstood. An example of the latter is the common misuse of SMED, a highly efficient toolset for reducing machine changeover times, used many manufacturers.

The main value of faster changeovers is the ability to reduce batch sizes and so reduce inventory waste and improve customer response, yet it is frequently the case that batch sizes are not changed after a successful SMED exercise and, not surprisingly, the new changeover disciplines are soon forgotten with the consequence that changeover times lengthen again and machine availability for production reduces. This type of situation arises when the kaizen is an isolated activity, rather than a focused improvement aimed at securing an enhancement to the overall business process. Again, waste reduction needs to be focused and driven against targets set by management. It is not good enough to ask production teams to 'eliminate waste in your area'. Clear target setting at high level and cascading goals down to meaningful targets in operational areas with regular monitoring and action on target gaps is critical – but all too often neglected.

Applying kaizen to the mountain of waste that we find around us is like trying to flatten Mount Everest one pebble at a time. A bigger, more strategic lever must be applied, and this lever is

provided by the conscious redesign of the business around ‘minimum waste’ value streams, leading to the targeting and prioritising of waste elimination work by management.

3. Continuous Improvement

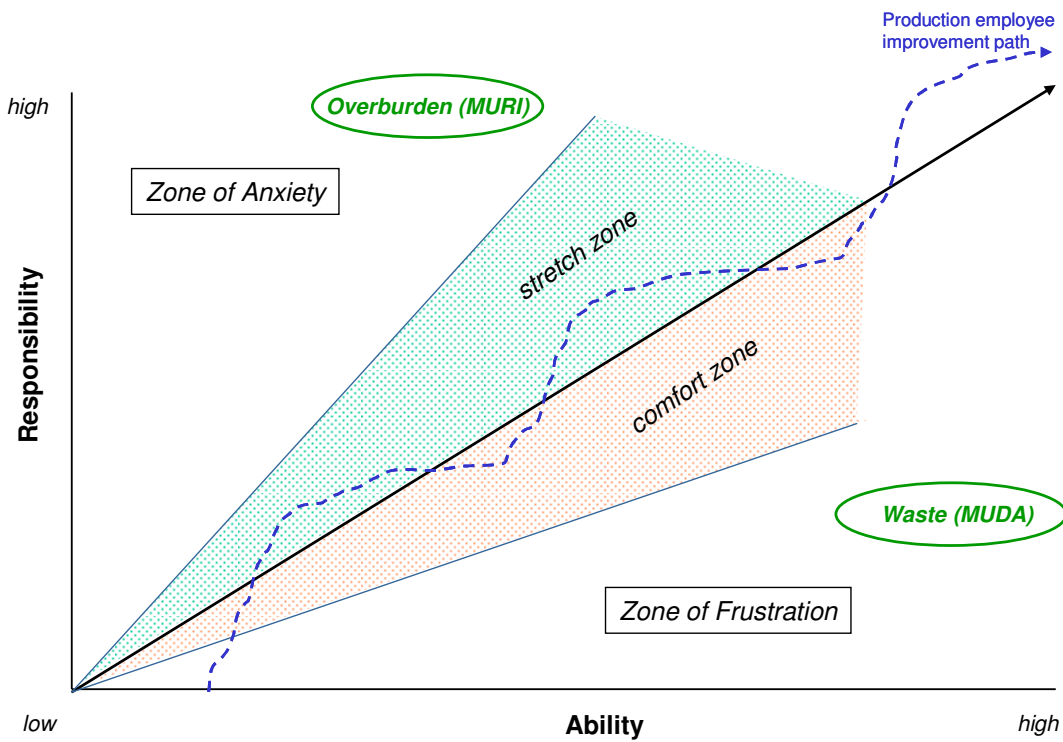
Many lean initiatives begin (and often end) with an attempt to introduce team-based continuous improvement, often through a series of concentrated two or three day kaizen blitzes. These initiatives often generate lots of good ideas and some dramatic local improvement but, as noted above, little sustained improvement. They tend to peter out when management attention moves elsewhere. Our aim must be stimulate an improvement process that continues to generate improvements that bring real business benefit over very long, indeed indefinite, periods of time.

One fundamental requirement, if continuous improvement is to be properly embedded, is that a sound set of Standard Operating Procedures (SOPs) must be established. SOPs are a key foundation for both lean and Continuous Improvement (CI). They document the ‘one best way’ of performing a process which all performers of that process must follow. This helps ensure consistency in both quality and performance – two critical factors for an effective lean organisation. SOPs also provide the baseline or ‘starting point’ for any CI activity. Unless this starting point is established, no ‘improvement’ is possible. The following quote from a large manufacturing organisation captures the problem well:

“We solve the problem but we don’t lock it in. This is because procedures are not specific enough and they are not always followed.” (Manufacturing Supervisor)

Figure 3: SOPs enable increase in employee effectiveness

Standardisation helps production employees to develop and take more responsibility without the risk of excessive stress levels



Source: Mihaly Csikszentmihalyi, Cardiff Business School

As improvements are made, the SOPs must be updated and the new methods standardised across the workforce, before further improvements should be considered. An effective foundation of SOPs

enables employees to be more productive without a consequent increase in stress (see Figure 3) as they have effectively improved their ‘Know How’ and thus their working ability. This means that they can take more responsibility. Placing more responsibility on personnel without helping improve their ability will eventually lead to stress and poor performance. As part of lean improvement, employees should be helped to improve their abilities and move into *comfort* and *stretch* zones (see Fig 3). Too many employees are underused and sit in the ‘Zone of Frustration’.

So how well is this requirement met by aspiring lean organisations? We find too many manufacturers with weak SOP disciplines – they are either not well defined or are not followed by production personnel. This is often not considered a critical area by much of Western manufacturing management or personnel and insufficient effort is put into creating and following effective SOPs. The result is ongoing task variation and process output and lower productivity from the workforce. This creates a very weak foundation for lean.

A second fundamental requirement to enable effective CI is achieving support from workplace teams to engage in team-based improvement activities. Organisations often put a great deal of effort into designing incentives to encourage participation, such as group bonuses, recognition of success (‘team of the month’), hearts and minds appeals (‘we all benefit from improvements’) etc. But what they should put more focus on is removing disincentives to participation. These disincentives can be many and varied, and to understand them, managers must think themselves into the mind of an average employee given the task of doing continuous improvement in addition to the normal challenges of

CI Maturity Model		
CI Level	Description	Key behaviour patterns
Level 1 Pre-CI	Interest in the concept has been triggered, but implementation is on an ad hoc basis	Random problem solving No formal improvement methods No understanding of CI as a process
Level 2 Structured CI	There is formal commitment to building a system which will develop CI across the organisation	Formal improvement initiative in place Use of structured problem solving Structured idea-management system Time provided for CI Good participation
Level 3 Goal Oriented CI	There is a commitment to linking CI behaviour, established at ‘local’ level to the wider strategic concerns of the organisation	<i>All the above plus:</i> CI focused on defined strategic goals CI is part of main business activities
Level 4 Proactive CI	There is an attempt to devolve autonomy and to empower individuals and groups to manage and direct their own processes	<i>All the above plus:</i> CI devolved to problem solving unit High levels of experimentation
Level 5 Full CI Capability	Approximates to a model ‘learning organisation’	<i>All the above plus:</i> Widespread learning & experimentation Autonomous problem solving teams

their job. They may then discover that factors such as worries about what such ‘improvement’ would mean for them are of prime consideration. An employee is after all not simply an objective ‘asset’ to the business. An employee is a human being with all the hopes and fears of an individual and who typically reacts to change by ‘fear of loss’ rather than ‘hope of gain’. Therefore their immediate questions will be around *How will this impact my job security? Will I lose my overtime if we are more efficient?*

Source: Based on ‘Developing continuous improvement capability’ by Professor John Bessant (Published in International Journal of Innovation Management, Vol 2, No 4, 2001)

Figure 4: Continuous Improvement Maturity

Will I lose my skilled status as a result of job standardisation? Am I expected to work even harder to fit in these CI activities as well as doing my job? Will I be able to do all the extra things as part of this multi-skilling? Why are we doing this and what’s the goal? The following quote captures some of the basic barriers that exist to CI.

“It would help us to have better knowledge of where to focus our improvement.”
(Production employee)

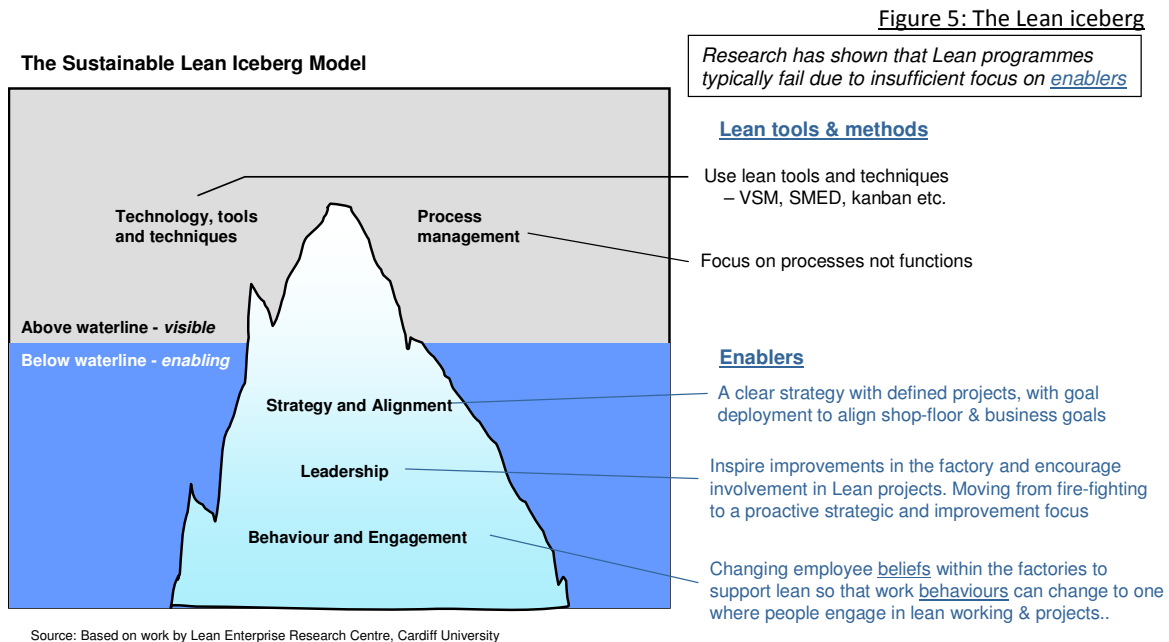
Clearly defined goals may be the most important requirement for workforce participation: what, exactly, is the objective? A few disjointed improvements to non-critical tasks hardly build an inspirational vision. Random, isolated kaizen events might provide a bit of fun and team-building but will hardly amount to a credible business transformation strategy. And business transformation is what lean should be all about. *How well is this requirement met by aspiring lean organisations?* If we consider the maturity of an organisation in its Continuous Improvement (see Figure 4) few would make it past level 2.

The Barriers to Lean

Companies that have not faced up to the issues discussed in this paper generally find that their Lean programmes soon run out of steam. The most common barriers that organisations encounter (or more commonly create themselves) when seeking to implement Lean practices within their operation, in our experience, are:

(a) Running kaizen before you can walk

It's a bit like signing up for gym membership after an indulgent Christmas, lots of initial enthusiasm with some fitness improvements, before relapsing into normal habits. Starting kaizen (i.e. applying lean in short, sharp, focused improvement activities on the shop-floor) is easy – it's keeping it going that is difficult. And unless there are clear goals, focus and organizational support, it will at best achieve some local successes ('ghettos of excellence') before slowly fading away.



(b) Over-focus on Lean tools

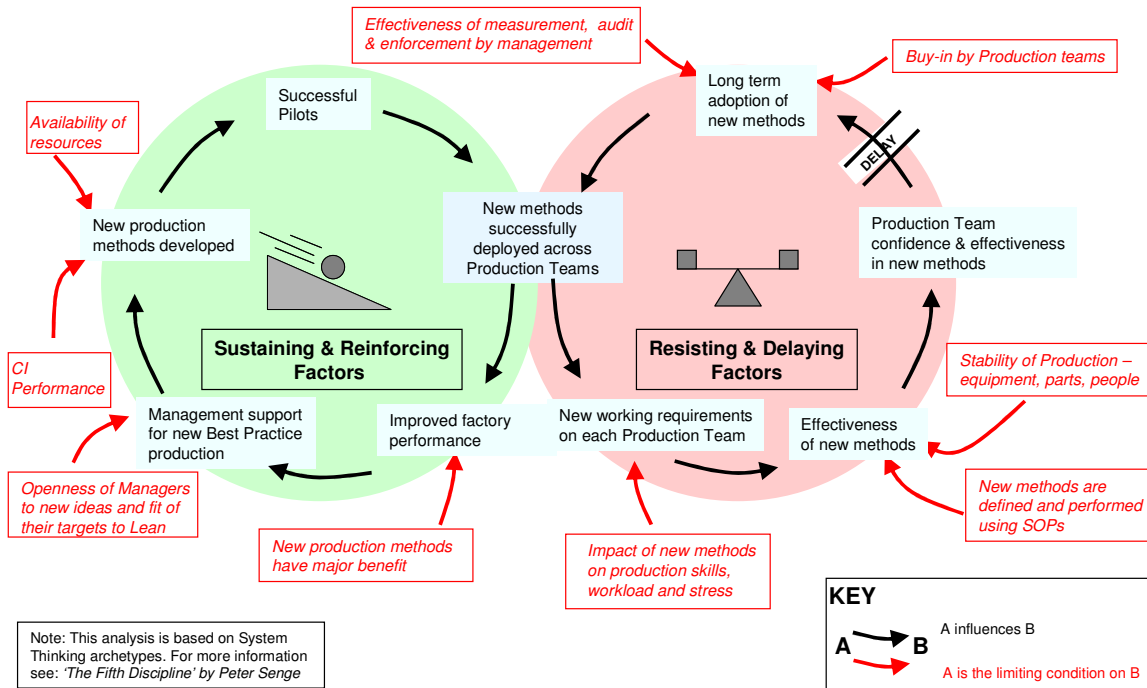
It's like kids at Christmas – they just want to open their presents and play with their toys. And just as Christmas is a lot more than the presents, Lean is a lot more than just the tools. Without management support and direction to drive a change in the culture to enable Lean, SMED, kanban, poka yoke and the rest will never have any sustained success. The analogy of the iceberg is a good one, with the Lean tools simply being the tip of the iceberg and the 'soft' areas of Strategy & Alignment, Leadership, Behaviour & Engagement being the larger 'invisible' part (see Figure 5). The hard work needs to be done 'under the water' within the organisation before the tools can be truly effective. This means getting the workforce understanding and believing in Lean and taking responsibility and 'leadership' in their areas of work. This is a significant challenge, but a critical requirement and needs management to first demonstrate leadership and trust.

(c) Lack an organisation-wide programme for Lean

In many factories you will find some evidence of Lean pilots or kaizen activities, but only in a few will you find organizational-wide commitment and focus on Lean. Unless Lean is tackled across the organization, then the customer value-stream cannot be effectively changed as there will be parts of it not playing to the Lean agenda – whether it be in Production areas where Supervisors prefer to run with large batch sizes and few changeovers, or in Supply Chain building large stocks in Distribution centres and selecting suppliers based on price only or even in Sales & Marketing where quarterly and yearly bonuses drive dramatic swings in demand on manufacturing – hardly providing the predictable demand that supports lean production.

(d) Not taking enough time in changing thinking and behaviour

Initiating Lean projects is much easier than sustaining Lean projects. We have seen many lean projects which have been successful at the pilot stage and so released into production. But once the project team leaves, the Lean operation begins to unravel (see Figure 6 for some key reasons). The project may have changed the logistics of the production operation, but unless people clearly understand how they have to operate in the new Lean operation and are trained and supported to enable this, it will simply be easier for them to revert to their previous operation. And unless the Supervisors in that area are supporting the Lean programme, they will allow it to revert. And this introduces a key point: the resistance to new lean methods is typically from the production supervisors, not from the production operators. Often the production supervisors/area managers feel threatened by the Lean programme – they may not fully understand the new methods or they may be worried that greater empowerment of workplace teams will degrade the role of middle managers. Lean will take them out of their comfort zone of ‘Business As Usual’ management and that is an unwelcome change for many. Only with strong support and education are they capable of leading the Lean changes and it is so critical that they do lead, for their people look to them for



direction and reward.

Figure 6: A systems view of the limiting conditions to Lean deployment

Source: Codexx (based on systems archetypes developed in ‘The fifth discipline’ by Peter M. Senge, 1990)

Note: For those readers unfamiliar with Systems Thinking diagrams: The left hand (green) circle is the positive reinforcing circle where Lean project deliver success, which in turn leads to more projects and increased success. But in reality, many Lean efforts ‘stall’ because of the right hand (red) circle which resists the positive growth. The impact of each of the factors (written in black) in the circle is determined by the state of the ‘limiting conditions’ shown in red.

(e) Not setting and monitoring clear targets

Ultimately lean must make a difference, indeed a fundamental difference to the performance of a business and as in any improvement journey, markers are needed to provide direction and measure progress. Unless Lean is being driven in an organisation by the sheer belief and will of its leader (which is typically only feasible in a small business or business unit), then it must use targets to drive and measure improvement. Yet many businesses fail to do this satisfactorily and as a result other initiatives will come in (as they always do) and steal time and effort from people and the lean projects may simply fade away. Targets such as OEE, OTIF, Inventory Turns and CI Savings can be very powerful if they are established, monitored and individual rewards aligned with them. If you don't do this, then don't expect lean to survive long – particularly in the Western business culture where new initiatives regularly arrive, just like the seasons.

(f) Lacking endurance – it's a marathon, not a sprint

Another common barrier we often see is a disease of Western management – impatience – and this is probably one of the key reasons why Western companies have struggled to implement Lean as well as Japanese companies. We like to make changes fast, but lean is such a fundamental rewiring of a business's processes, its culture and indeed its ethos, that this is a journey which requires years to succeed and must be sustained ever-after. If management cannot envision a programme lasting 10 years to fully embed lean in their business, then they will not succeed in becoming a truly lean business. This disease of impatience is often compounded by management changes. Within the span of a 10 year programme, a number of the senior management team will change. New arrivals will undoubtedly come with the expectation of changing things – putting their own stamp on the business with new ideas and initiatives. It is key to the success of lean within the business that unnecessary new initiatives are prevented and new ideas are focused on reinforcing the existing lean programme. There is plenty of opportunity for new managers to innovate and refresh the approach without undoing the fundamentals of the on-going lean programme.

(g) Too many programmes, too many tools

Too many manufacturers are like butterflies when they should stick to being caterpillars.... They flit around trying out lots of different improvement methods – Lean, 6-sigma, TQM, TPM, Agile etc. without finishing any of them – when they should just stick on one improvement and *munch* on that until it is completed. Many Western businesses are 'curious' and want to try new things, but sustainable improvement demands discipline and *stickability* too. All too often new initiatives are introduced that displace existing lean activities even though they are really variations on the lean theme, or tools that could be brought within the existing lean programme. At best this will split resources; at worst it will cause confusion and cynicism toward any change. A classic situation occurs with Lean and 6-sigma, with many manufacturers having both simultaneously active with separate resources and goals. But 6-sigma can be approached as a specialist improvement toolset, useful where more technical skills are required to tackle complex process variability and improvement issues. Similarly TPM provides useful tools and approaches that help in increasing quality and output from equipment. Both methods can be effectively brought under the lean umbrella, not projected as alternatives to the lean programme.

(h) One size fits all...

Let's throw a final spanner into the works: Lean thinking came from Japan, a country whose cultural attributes are significantly different from Western countries (who themselves differ from each other). See Figure 7 for a comparison of Japan and the UK against key cultural dimensions using Professor Geert Hofstede's cultural dimensions model. This reminds us of the major cultural differences between Japan and the UK, for example, with the Japan having much longer term thinking and also much lower individualism than the UK. This helps explain the Japanese ability to sustain improvement programmes over the longer term (compared to the lower level of patience for change in Western manufacturers) and also the natural teaming and conformity inherent in Japanese

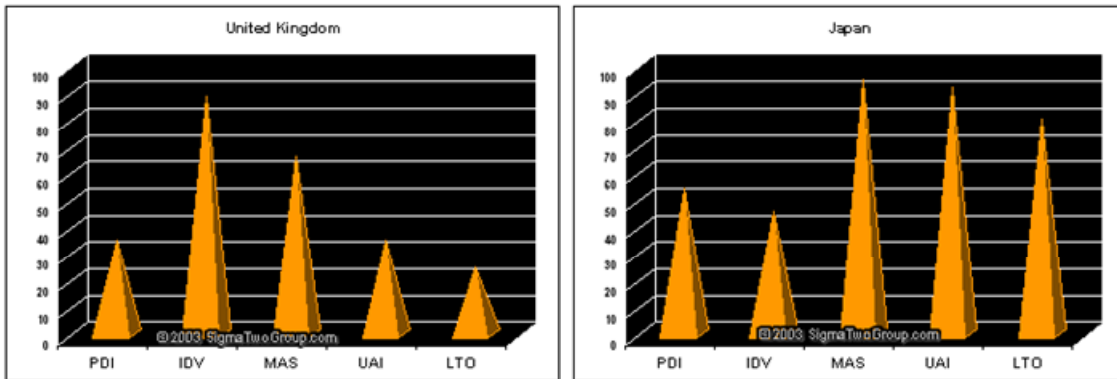
society (*'The nail that sticks up will be hammered down'* is a well known Japanese proverb). Lean approaches have been developed to fit with the Japanese society. To exploit them to the full in Western businesses, the different cultural norms in the West must be considered. For example, Lean programmes should be defined to show quarterly progress and benefits; individual creativity should be fostered for idea generation and improvements – rather than just groupthink.

As well as the national culture, the culture within the company must be considered. Cultural differences between companies can be as significant as those between nationalities. It will be a very different prospect introducing CI teams in a company that is used to an autocratic management style than in one where staff are encouraged to use their own initiative. Lean must always be tailored to the circumstances. In Japan, Kawasaki has its KPS and Canon its CPS. This tells us two things. Firstly that each company has tailored lean to its own unique needs. Secondly that each regards its lean embodiment not as a temporary programme but a permanent 'system'.

Cultural differences should not be used as a reason that 'lean won't work here' – for Nissan and Toyota have successfully applied Lean in their overseas factories and the Nissan factory in the UK has been the most productive in Europe for years. But when applying lean to your organisation, consider how best to tailor the goals and approach to your own unique culture. We see a number of large western manufacturers doing this by developing their own lean-based 'production system' – such as the 'Bosch Production System' (BPS) and 'Rolls-Royce Production System' (RRPS), which also helps them gain the benefits of a standardised approach across multiple factories and regions.

Figure 7: Cultural differences will affect Lean approaches

There are clear cultural differences between Japan and Western countries in Individualism and Long Term Orientation



Explanation

- PDI – Power Distance Index** – the extent to which the less powerful members of organizations accept that power is distributed unequally
- IDV – Individualism** – Individuality v Collectivism
- MAS – Masculinity** – How strong values of being assertive and competitive are in the national culture
- UAI – Uncertainty Avoidance Index** - deals with a society's tolerance for uncertainty and ambiguity
- LTO – Long Term Orientation** – The degree of long term thinking in the society

Source: Professor Geert Hofstede

So what's the answer?

We hope to have shown that whilst the fundamental requirements for Lean are clear, making the changes required to achieve these requirements requires a journey of change that touches every aspect of a business. A few kaizen workshops or education on fishbone diagrams and value stream mapping simply won't do. Lean is not a cosmetic makeover, it requires re-engineering the heart and mind of an organisation if it is to deliver on its potential.

Companies that start their lean implementations with kaizen-type activities are putting the cart before the horse. The logical approach to lean implementation, based on the lessons learned over

the last two decades, by ourselves and others, is that it must be strategic in scope and long term. Specifically, we recommend that the journey to Lean manufacturing follows the following principles and sequence:

Key principles:

- Develop an overall strategy, around your value chain and your culture, that embeds lean and sets long term goals and measurable targets.
- Use pilots to demonstrate the approach in different areas of the value chain, resource them to ensure success and use them as the catalysts for spreading Lean across your business.
- If you can start with a 'clean sheet of paper' – a green field site – then do so. This is how Nissan started its Sunderland factory in the UK and it deliberately hired employees with little or no automotive experience so that they were not wedded to existing 'Mass Production' thinking. Creating a factory and its processes based on Lean principles is much easier than converting an existing factory.
- Find Lean champions, give them resource and responsibility and visibly reward their success.
- Engage your key suppliers and customers in the programme.
- Use benchmarking and external visits to exemplar companies to 'open the eyes' of your managers and employees as to what is possible.
- Learn from failure, don't punish it.
- Put in place Lean metrics and reward people for achieving them.
- Be persistent, but also patient.

Recommended sequence:

Although we are mindful of the fact that 'one size does not fit all', a recommended sequence for implementing lean within a business occurs in 7 stages:

1. Identify customer value and the value stream(s) through which it is delivered
2. Re-design operations around these value-adding processes, out-sourcing those process stages where you do not have, or aspire to have, industry-leading expertise
3. Design as much waste (non-value adding activities) out of the system as possible
4. Plan for a smooth flow of materials through the value stream processes, ideally in response to actual customer demand, not forecasts
5. Standardise and systematise the new working practices
6. Adopt a lean mindset in managing the business, starting with the replacement of traditional cost accounting methods which encourage waste with value stream based accounting methods that are in harmony with lean goals
7. Generate further incremental improvement through continuous improvement teams working on targeted sources of waste (the 'search for perfection').

Why is this approach not more commonly adopted? Is it perhaps because senior management often see lean as just another productivity system and are too ready to delegate it to lower management levels where fundamental change cannot be tackled? Is it that management prefer to go for quick wins, rather than undertake the hard work required in building the optimised future state? Is it because many lean practitioners have been trained in the tools and techniques of team-based problem solving but do not have the in-depth understanding of lean transformation or the business skills necessary to attempt it?

Of course organisations do achieve year-on-year productivity improvements and lean tools such as Six Sigma, kanban etc have, in recent years, assisted this drive. But business has always made

ongoing efficiency savings – doing so is not lean, its just business as usual. True lean offers vastly greater benefits but it also demands senior management’s commitment and active participation.

What next?

If you recognise that your own lean programme has not delivered, then what should you do? We suggest that you use this whitepaper and particularly the self-assessment panels to take a long hard look at the goals and approach you are taking in your lean programme. And we strongly recommend that you do this with a cross-functional and cross-level group of managers and employees (and customers and suppliers if you can). Once you have performed a *Diagnosis* of your stalled lean programme, you can then define the key actions required to get it started again. You then need to put in place a Vision and Strategy for Lean-enabled transformation within your business, supported by quantifiable targets. Goal deployment (Hoshin Kanri) should then be used to cascade these goals down through the organisation and reward systems aligned with them.

The uncertainty about Lean Manufacturing that once led companies to doubt whether it was “for us” has long since disappeared. Lean is for everyone, not just the high volume automotive sector, not just the global organisations. The only question now is, how well can you do it? Because if you are not effectively applying lean in your business, then every day you are throwing away money and under-serving your customers. And in today’s global economy there is always someone else possibly ready and certainly willing to take your customers away.

About the authors

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