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REPORT, DOCUMENT

Welsh Government Toyota Lean Clusters Programme

Improving productivity is one of the key challenges faced by the Welsh and UK economies. Measured by GVA per hour worked, productivity per hour in Wales is 17.2 per cent lower than the UK average and the lowest of all nations and regions in the UK. There is a need within the manufacturing sector to spread the best practice of our top performing businesses to help close the productivity gap between Wales and the rest of the UK.

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Foreword

Toyota are generally credited as being the source of Lean and Lean thinking in business. When Dan Jones and Jim Womack first tried to understand why Toyota were doing what they were doing and why they were so very good at it – they coined the phrase “Lean”. They identified the Toyota Production System (TPS) as the foundation for Toyota’s success.

Today, many of the world’s leading companies have developed their own versions of Lean and their own production systems. There are many similarities and differences between the various production systems but Toyota are at the core of what works globally. A key element of Toyota success has been the Toyota Production System, but always allied with the Toyota Way; The Big “Why” that drives Toyota team Members to always look to improve.

A fundamental ethos within Toyota is that everyone needs to work to understand the Toyota Way and the Toyota Production System. Everyone has a responsibility to develop their own understanding.

The resources in this programme will help you to develop your own understanding so that you can apply the basic principles within your operation. Success is very much dependent on you taking the time and making the effort to absorb, develop and use the basic thinking to make your business better. These resources will help you do just that, to develop your understanding of tools, techniques and to answer the how and why questions of making them your own, for your business, with your people.

Professor Richard Keegan
Adjunct Associate Professor Lean Operational Excellence Trinity Business School

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Introduction

Improving productivity is one of the key challenges faced by the Welsh and UK economies. Measured by GVA per hour worked, productivity per hour in Wales is 17.2 per cent lower than the UK average and the lowest of all nations and regions in the UK. There is a need within the manufacturing sector to spread the best practice of our top performing businesses to help close the productivity gap between Wales and the rest of the UK.

This issue has been historically recognised and reflected upon in Welsh Government policy. ‘Prosperity for All: Economic Action Plan (2017) identifies the need to improve productivity as one method of contributing to economic growth.

In recognition of this need, since 2013, The Welsh Government has partnered with the Toyota Lean Management Centre based at the company’s Deeside engine facility to supporting companies to improve their competitiveness through exposure to Toyota’s globally renowned lean expertise.

Toyota is recognised as the leading world class manufacturer and their performance levels, and high productivity rates which have been sustained over decades, are attributed to what is known as The Toyota Way. Such concepts and systems are demonstrated and reinforced by giving programme participants direct access to the Toyota Motor Manufacturing Ltd.’s production facility at Deeside.

The Welsh Government’s Toyota Lean Clusters Programme aims to deliver sustainable productivity improvements and generate profit benefits through the embedded learning of world class tools and techniques in a highly structured system.

Since inception, this programme has been enhanced in terms of breadth and depth, providing an opportunity for more companies in Wales to experience an immersive

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engagement with Toyota Lean experts. This is a unique opportunity to engage with the world class manufacturer, Toyota, and to embed capabilities and spread best practice.

To those companies who have already embarked on their Lean journeys, We look forward to hearing of your results. And to those who have yet to start, we hope the news of other companies reporting their successful projects and practices and all sorts of systems and process changes, both large and small, with provide a catalyst to start making improvements.

Why does the Welsh Government engage with the Toyota Lean Management Centre?

The Welsh Government recognise the important role it has in supporting companies as they strive for sustainable growth amid rapidly changing circumstances and in an environment with constant disruptions. In the last couple of years, we have seen significant changes in the form of global competition, a technology explosion, Brexit along with new trading arrangements, the Covid pandemic, Climate Change, and Russia’s attack on Ukraine, creating not only a not only a humanitarian disaster but also impacting on energy price surges and fuel and food goods shortages.

The delays caused by global shipping problems have disrupted world trade, leading to raw material shortages and price increases. And we have seen serious issues with labour availability and inflation.

It is difficult to imagine a more difficult set of challenges. But, the way we address and overcome these challenges can give us a real competitive advantage.

The exemplar we see at Toyota in Deeside provides a model of excellence and an opportunity to learn and improve, not only in manufacturing environments but all systems and processes, including public and private services.

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The Toyota Global Vision includes leading the future mobility society, and enriching lives around the world with the safest and most responsible ways of moving people. This includes a commitment to quality, ceaseless innovation, and respect for the planet. And meeting challenging goals by engaging the talent and passion of people who believe there is always a better way.

With this vision, and with the track record of performance improvements and high levels of productivity, achieved not through automating where possible, but through continuous improvement and respect for people, we have a new benchmark.

We believe in working in partnership; it has never been more important to work together. If we can work with Toyota to disseminate their expertise throughout Wales, and work with industry to find better ways of achieving objectives, then we will be on the right path. To borrow the Wales football motto, ‘Together Stronger’, and as the motto states on the Wales crest ‘Gorau Chwarae Cyd Chwarae’ – ‘best play is team play’.

Toyota Lean Clusters Programme

The Opportunity

The Welsh Government and the Toyota Lean Management Centre, Deeside, have collaborated to offer businesses in Wales a unique opportunity to achieve sustainable improvements in competitiveness.

The programme aims to bring measurable improvements in productivity, through the sharing and coaching of lean management principles.

Delivered by experienced Toyota practitioners, participants will receive a mixture of:

- Classroom theory
- Immersive shop floor observation

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- Examples of practical application all delivered at Toyota's Deeside engine facility, plus
- Worksite coaching at participant company sites to support productivity improvements.

The Programme

The Toyota Lean Clusters Programme consists of three independent elements:

Eye Openers

For companies who are new to the concept of Lean, an introduction to Lean Principles and the Toyota Way through 1-day taster sessions held at Deeside.

Lean Start

A hybrid programme for companies ready to change that includes three days coaching at Toyota Deeside plus five days practical project assistance from a Toyota coach at your own company site.

The focus will be on identifying and agreeing a project that will be tackled during the Lean Cluster Programme. An effort will be made to quantify potential impacts of the project.

Lean Plus

Lean Plus provides ten days of in-company support from a Toyota coach who will help instigate and guide larger, transformational Lean projects. The focus is on creating and capturing value within participating companies through the mentoring and coaching of local staff. Supported by Toyota coaches they will learn about, understand and deploy Lean tools, techniques and thinking to address competitiveness issues within their businesses.

Lean Networks

The programme will support a Lean Network giving participants the opportunity to

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connect, engage and learn from each other.

Introduction to Participants

Our first cohort included companies from North and South Wales, allowing us to create the North and South Wales clusters.

North Wales Cluster:

- Raytheon Technologies UK
- Hanson Cement Padeswood

South Wales Cluster:

- Fitzgerald Plant Ltd.
- SO Modular Ltd.
- GTS Flexible Materials

These clusters will continue to grow as the programme progresses, creating a network of businesses across Wales that can share and grow together.

Welsh Government – Toyota Lean Cluster Programme Participants 2021/22

Image
Connecting, Learning, Sharing. Bringing companies across Wales Together.

With support from: Welsh Government, Toyota Lean Management Centre and World Class Business Ltd.

Introduction to Case studies

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Our participants have seen the benefits of engaging with this programme in many different aspects of their businesses. From increased efficiency and productivity to cultural changes on site, the participants have taken what they've learned and made it their own.

These case studies use four categories to highlight how the companies have progressed through the programme:

- Lean Start Project Objectives
- Key Challenges
- Key Changes
- Results

Capturing the key impacts and challenges the companies faced, plus the results of applying the TLMC teachings.

Raytheon Technologies UK

Raytheon UK is a technology company focused on Defence, Aerospace and Cyber & Intelligence with sites across the UK; in England, Scotland and Wales.

A fully-owned subsidiary of Raytheon Technologies (previously Raytheon Company) in the U.S., we've been in the UK, for more than 100 years. Raytheon UK's contribution to the UK economy in 2019 stood at £762 million*, supporting 8,300 jobs in the UK supply chain.

Address
Broughton

Website
www.rtx.com/uk

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*This number is representative of Raytheon UK Operations and impact of Raytheon Company spend in the UK prior to the merger with UTC in 2019

What the company do

We are proud to have developed a skilled British manufacturing workforce, who have become leaders in technological innovation. In the UK, our workforce is committed to four primary sectors – Airborne ISR, Sensors, Weapons and Cyber and Intel.

Lean Start Project Objectives

- Process mapping improvement.
- Quality improvement.
- Reducing time-wasting meetings from their workload.

Key Challenges

- Reducing number of times that they modify their drawings before it reaches approval.
- Re-work categorising and monitoring.
- Drawing approval loop monitoring with corrective action.
- Identified that they have standards but are not following these standards.
- Create better meeting plan to reduce time wasted on these.
- Want to reduce model loading time.
- Want to reduce decision steps in project processes. • Need to understand waste.

Key Changes

- Introduction of Kaizen thinking and identified many kaizen opportunities.
- Identified 41 actions to drive improvement into process.

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- Created improved meeting plan to reduce time wasted on unnecessary meetings.
- Have decided to only load models for local working areas rather than the whole plane.
- Improved processes for both drawing release and change process.
- Drawing rework reduction – Streamlined process map to reduce number of decision steps

Results

- New process mapping system in place and have created a teamwork framework to aid in that mapping.
- Over 40k hours of additional change capture by the change control process.
- Reduction of drawing re-work through monitoring and PPS actions from 7 loops to 3. This is equivalent to £175k cost avoidance.

Hanson Cement Padeswood

We are part of the Heidelberg Cement Group, which has leading global positions in aggregates, cement, and concrete. Hanson UK is split into four business lines – aggregates, concrete, asphalt and contracting and cement – which together operate around 300 manufacturing sites and employ over 3,500 people.

Website

www.hanson.co.uk/en/Hanson-Cement Padeswood

What the company do

We produce aggregates (crushed rock, sand, and gravel), ready-mixed concrete, asphalt, cement and cement related materials.

Lean Start Project Objectives

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- Standardising plant maintenance.
- Developing cultural change/ acceptance of lean processes.

Key Challenges

- Work from breakdown to breakdown rather than identifying preventable causes.
- Culture prioritising work based on feeling rather than facts, leading to the wrong things being worked on.
- Not scheduling time to work on issues/ the program.
- Lack of communication between departments. Results
- Changing cultural behaviour to view work as a production line rather than work on daily crisis management.

Key Changes

- Have reduced backlog of problem notifications from 1750 to 460.
- Re-assessed Weekly planning meeting. Created a clear agenda with clear expectations, which has led to clear communication between departments.
- Created a new work plan which is easy to update. Easy to add last minute plan changes and reason for the change.
- All work requests now follow a template based on Toyota's Breakdown sheet. This has been adopted by crafts.
- Planned work is now clearly prioritised to streamline work in order to respond to changes efficiently.
- Visibly returned W/O status to help close the loop.
- Changing cultural behaviour to view work as a production line rather than work on daily crisis management.

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Key Changes

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- All work requests now follow a template based on Toyota's Breakdown sheet. This has been adopted by crafts.
- Planned work is now clearly prioritised to streamline work in order to respond to changes efficiently.
- Visibly returned W/O status to help close the loop.

Results

- Increase of planned work completion from 65% to 91%.
- Stress relief and increased head space for further improvements.
- Saved 2 hours out of working day by switching to the new plan.
- A fair platform for all workers to influence plans.
- Improved data gathering has helped build the information history.
- Clear structure to weekly planning meeting, allowing better communication for discussing priorities (backed by data).
- Taken on two dedicated graduates (Improvement Engineers) to lead problem solving.

Hanson Cement case study example

Since engaging with the Toyota Lean Clusters Programme, Hanson Cement have taken on two graduate Improvement Engineers. They have been working on the following issue on site:

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Clinker Filter

Following a £23,000 refurbishment, bags were continuing to fail.

This failure caused four hours of plant disruption and reduced production by a week. If not dealt with it had the potential to cause a site shut down due to the environmental impact.

The RCA team removed the failed bags and found that they are all damaged in the same place. By using a camera, they located the failed area, which cannot be repaired until shutdown. Further improvements will be made during this planned shutdown period.

Reinforced bags are being produced as a stop-keep to help contain the problem until such time as proper repairs can be made.

Other site projects and new initiatives

Workshop improvements have included a laydown area to aid with problem solving. Better IT facilities including tablets with notification software are being developed to help report problems with clearer information.

Fitzgerald Plant Services Ltd.

Fitzgerald Rail & Construction Equipment Services Ltd, based in Cwmbran, South Wales, is an established provider of specialist services within both the rail and construction industries. Established in 2007, Fitzgerald Rail & Construction Services have built up an outstanding and enviable reputation for delivering quality work and professional service. Our business is built on a foundation of strong service and customer focused solutions.

Address

Fitzgerald Plant Services Ltd Avondale Way Avondale Industrial Estate Cwmbran

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South Wales NP44 1TS

Website
www.fitzgeraldplant.co.uk

What they do
We aim to provide a one-stop shop for all our customers' requirements. Specialists in repairs, maintenance, upgrades to RIS-1530-PLT, engineering services, manufacturing, part sales and heavy haulage transport; we endeavour to provide a fully comprehensive service 24 hours a day, 365 days of the year.

Lean Start Project Objectives

- Internal Defect Reduction through analysis.
- Date/time losses and associated costs.
- Training and upskilling staff.
- Introduce S.O.P.

Key Challenges

- No data available. Decisions and improvements were prioritised based on opinion not fact.
- No KPI's or Targets.
- Previous plans in place not used by employees.
- Accruing too many man hours and materials on fixed cost projects.
- Lack standardised detailed staff inductions, no CPD. • No S.O.P.

Key Changes

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- Daily data collection and weekly analysis of data. Spreadsheets implemented and adopted by each department.
- Have implemented loss time tracking systems to capture waste.
- Andon system put in place.
- Identifying and eliminating inefficient practices.
- Engagement between shop floor operators and senior management improved.
- Start 5s process of workplace.
- Cultural behavioural changes throughout company.

Results

- Better understanding of defect trends, root causes of issues identified and recorded immediately.
- Clear understanding of business wastes and how to reduce them.
- Decisions driven by data and facts throughout operations.
- Improved built-in quality.
- Higher production rate through workshop.
- Improved resource control.
- More accurate timescales for future work.
- Visual improvement in workshop as a result of waste reduction.
- Significant improvement in operations.
- Implemented two day induction programmes and CPD for all staff.
- Uniformity of work processes.
- Improved workplace morale and customer valuation.
- Want to progress to Lean Plus.

SO Modular Ltd

Established in 1996 by our CEO Jonathan Hale, SO Modular Ltd are a rapidly expanding timber frame manufacture. Our highly experienced, growing workforce can ‘Design, Supply and Erect’ your timber frame – home, apartment block, retail

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outlet or education establishment, on time, on budget and of the highest quality standard.

We continue to be at the forefront of innovative and creative solutions within the construction industry, pushing boundaries and developing products that enable us to boost efficiency, sustainability and cost effectiveness across a diverse range of construction projects.

Address
Milland Road Industrial Estate JCG Building Neath SA11 1NJ

Website
www.somodular.co.uk

What the company do
SO started as a purpose made joinery. We now design, manufacture and innovate timber frame components for large national homebuilders, contractors and housing associations across the United Kingdom.

With the construction industry constantly changing to incorporate more environmentally friendly practices, the sustainability of products and more time and cost reducing methods, here at SO we are always researching, developing and adapting to meet these demands.

Lean Start Project Objectives

- Improve treatment and processing routines.
- Standardise workflow.
- Remove system inefficiencies.
- Improve quality control.
- Communicate with sales department.

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- Involve senior management in programme.

Key Challenges

- Lack of process data.
- Change from reactive work to standardised best practice methods.
- Engagement with senior level stakeholders.
- Analysis of collected data.
- Producing quality product to meet increased demand.
- Cultural belief that operators are too busy to collect data and identify anomalies.
- Engaging senior management.

Key Changes

- Have created Production Control Boards.
- Have implemented new safety measures in treatment area.
- Collecting data.
- Identified source of delays in wood treatment area.

Results

25% increase in net productivity after identifying challenges in wood treatment area.

- Have seen 30 minutes/day saved in sawing process as a result of wood treatment improvements.

GTS Flexible Materials

GTS's UK operations started in 1965 as part of US corporation G.T. Sheldahl. The company became an independent, owner run operation, GTS Flexible Materials, in

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1977.

They have an annual output of around 4 million sqm of laminated composites and adhesive coated tapes, 90% of products are exported, mainly to Europe, the Far East and the USA. They operate in a global distribution network, including sales subsidiaries in Germany and France.

GTS produce laminates, film insulation and adhesives that are necessary for a range of different industries. GTS's materials are suitable for a wide range of products. Looking at the final applications as well as our customers' processing capabilities we have identified four target markets: Automotive, Power Distribution, Connecting and General Electronics.

Address
Unit 41, Rassau Industrial Estate Ebbw Vale GWENT NP23 5SD

Website
www.gtsflexible.com

Lean Start Project Objectives

- Practical problem solving.
- Improving process efficiency of slitting machines.
- Categorising historical defect data to identify and prevent current issues.

Key Challenges

- Downtime on machine per hour (operator absence whilst looking for material).
- Reducing/simplifying element time to improve inefficiency.
- Standardised work systems could be improved.

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- Improvements needed in data collection or quantitative information regarding issues experienced.
- Need to improve KPIs to track efficiency and progress.
- High volumes of demand stretching current shift capacity, so efficiency improvements needed ahead of additional shift pattern introduction.

Key Changes

- Looking at internal vs external work.
- Prioritising areas for improvement (A & B).
- Have a process map of systems.
- Have implemented real time data display system.
- Have installed Andon

Results

- GTS has developed KPIs to better measure performance against daily capacity.
- Cultural changes: GTS has a more efficient meeting schedule i.e daily review before problem solving meeting. This schedule had previously been in reverse. This allows staff to raise problems at the daily review, spending more time for actual problem solving later.
- GTS is progressing with their andon.
- GTS is keen to take part in the Lean Plus Programme

View from Toyota

One of Toyota's founding, guiding principles is to do good for society. The Toyota Lean Management Centre was created in the Deeside Engine Plant in 2009. The aim was to share insights into the Toyota Production System and the Toyota Way with non-competitive companies who were interested in developing their

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competitiveness and productivity, using aspects of the Toyota experience and tools.

The Toyota Lean Cluster (TLC) Programme with the Welsh Government is the latest iteration of this support. We are happy to support this activity and are delighted to see the results achieved by participating companies. We look forward to evolving and developing our support for Welsh companies as we continue to apply our kaizen/continuous improvement approach to the TLC activity itself.

Resources

Toyota Lean Clusters Programme Resource website:

www.businesswales.gov.wales/toyota-lean-clusters-programme-resource-page

Since 2009, the Toyota Lean Management Centre, Deeside, have been coaching companies on the Toyota Way and the Toyota Production System. For more information on Lean Training at Deeside, please go to:

https://tlmc.toyotauk.com/

Sign up info
Grant supports are available from Welsh Government, with Welsh Government supporting companies with up to 75% of the programme costs through state aid.

Eye openers
With 50% support from Welsh Government, these sessions will cost £190 per person excl. VAT.

Lean Start
After 75% Welsh Government support, the cost per company for up to 3 delegates is £1,703 excl. VAT.

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Lean Plus

With 50% Welsh Government support, the cost of Lean Plus is £3,180 per company excl. VAT.

Get in Touch

If you are interested in participating in the Welsh Government Toyota Lean Clusters Programme please contact TLMP@gov.wales.

Further details can be found at:

https://businesswales.gov.wales/toyota-lean-clusters-programme

FAQ

Why do the Welsh Government want to support the Toyota programme?

Productivity is important. This is a key part of the Manufacturing Future for Wales meeting and a major tenet of the UK National Manufacturing Summit that was held on the 16th and 17th March 2021. We see the impact of Toyota engagement leading to considerable increases in productivity. And, as the New York Times columnist and economist, Paul Krugman, said, “Productivity isn’t everything, but in the long run, it’s almost everything.”

Why Toyota? Why is the Welsh Government so interested in supporting such a programme?

We have been looking at the evidence of companies engaging with Toyota and seen the success of Irish companies, led by Richard Keegan through Enterprise Ireland, that have engaged with the TLMC programme (over 100 case studies here Lean Case Studies – Lean Business Ireland). We have carried out an independent evaluation of the programme we supported in Wales over the last few years; listened to TLMC and Richard Keegan about what works best; and read books and articles

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about Toyota, and Toyota supplier networks, to understand what can be achieved with Toyota's support.

How does this programme differ from other Welsh Government-supported programmes?

Programmes such as SMART Productivity, and the Productivity Business Enhanced Programme, and UK programmes such as National Manufacturing Competitiveness Levels (NMCL) are excellent programmes where experts diagnose problems and provide solutions. They help you fix the immediate problem. Toyota Lean support is very different. It embeds capability so companies can diagnose and fix their own problems. But this has not worked as well as it might have done in the past, with the short exposure to Toyota. That is why we are listening to Toyota and Richard Keegan and building the evidence to establish new programmes. Professor Steven Spear summed up what he saw at Toyota plants in 4 key points:

1.There is no substitute for direct observation. 2.Proposed changes should be structured as experiments (Plan – Do – Check – Act).
3.Staff and managers should experiment as frequently as possible.
4.Managers should coach, not fix.

Remember the proverb, 'give a 'man' a fish, and you'll feed him for a day; teach 'him' how to fish and you'll feed him for a lifetime' is highly appropriate to reinforce the point.

What is the Government Support?

The Toyota Lean Clusters programme in Wales is a programme based on what Toyota and Richard Keegan have outlined. We have listened, and are continuing to listen. We have completed the first Lean Start and we have 5 companies who have realised significant improvements (April 2021). We have delivered Eye Openers, and we have received very positive testimonials. We are ready today to take your expressions of interest and start the journey. We are providing state aid financial

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support for the various elements of this programme until 2024.

Toyota Lean Clusters 2021 Flyer English V2.pdf (gov.wales)

What is the Toyota Way?

- The Toyota way is a system, it includes designing and then continually improving a value stream to deliver customer satisfaction.
- The system is based on developing both the process and the individuals. The concept of ‘Go and see for yourself, ask questions and find out what is really going on’ is a key facet. Toyota managers do not depend on anecdotal evidence. They call this ‘go-and see’; Genchi Genbutsu.
- Toyota have developed tools and techniques to support their systems; these are not all going to be appropriate for other organisations, e.g., Just in Time. • There is huge importance placed on standardised work. Toyota have developed a culture of honesty in problem solving, with no blame, indeed gratitude, for pointing out when things are not right.
- A system of continuous improvement exists through applying the scientific method, planning and running experiments, comparing results to predictions, and developing knowledge. This is very different to the approach of, ‘try this and see what happens’ and ‘trial and error’.
- People on the outside see Toyota as having a relentless pursuit of waste and removal of stock and conclude ‘it won’t work here’. This is not the case. Toyota have a relentless pursuit of understanding the system and holding the correct levels of stock and absorbing necessary waste. They call this heijunka, the reconciliation of waste (Muda), overburden of staff (Muri) and the jerkiness/unevenness of customer orders (Mura).
- Toyota find solid partners, and grow together for the long term, and treat suppliers as an extension of their own business. For this to work, Toyota cannot have several suppliers of the same part, so they choose one or preferably two suppliers per part, and develop long term, mutually beneficial relationships.

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Cost reductions are not pushed down, they are achieved with Toyota support.

Is the Toyota Way limited to Manufacturing environments?

It is important to realise that the Toyota Way is not limited to manufacturing operations. The book, ‘This is Lean’ by Modig and Ahlstrom explains how the approach can be applied successfully in services, with a case study presented for health care. This demonstrates the importance on having a focus on flow efficiency and not resource efficiency. If you find yourself noticing that waiting time generates new needs and closes windows of opportunity, how long throughput time and handling too many tasks generates secondary needs, too many emails trigger stress, juggling with too many things makes people lose control, and starting over on the same task (restarts) generates mental set-up time, then you are not part of a Lean system. The higher the utilisation, the lower slower the f low, as work is held up in queues and inboxes. The paradox is that a greater focus on resource efficiency and utilisation tends to increase the amount of work there is to do, and subsequently delivers poorer service.

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