



BUILDING A LEAN BUSINESS SYSTEM

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Lean Management Summit



- Marks a significant turning point for **Lean Thinking** in Germany – after two false starts in 1991 and 1997
- The establishment of the **Lean Management Institut** with **RWTH Aachen** lays a solid foundation here
- Lean management has spread well beyond the shop floor, **across sectors** and **across the world**
- Germany at this point **lags behind** – although we have always believed that German industry has a significant contribution to make to the future of Lean
- **Lean is actually a “job saver” rather than a “job killer”**

Toyota - the Lean Model



- Most people now recognise that Toyota is **setting the pace** – based on its Lean business system
 - It leads in efficiency and quality around the world
 - It also leads in time to market for new products
 - And in introducing new technologies - like hybrids
 - It is globalising assembly and localising parts supply
 - It has overtaken Ford and plans to overtake GM!
- Superficially Toyota's **functional organisation** looks not unlike a German firm!
- So what distinguishes the way it operates?

Toyota's Lean Strategy



“Brilliant process management is our strategy.

**We get brilliant results from average people
managing brilliant processes.**

**We observe that our competitors often get
average (or worse) results from brilliant people
managing broken processes.”**

Lean Thinking is Process Thinking

**Just think what you could do with brilliant people
running brilliant processes!**



Lean Thinking

- The objective is to manage the business backwards from the customer definition of **value** - not forwards from your **organisation** and your **assets**
- To create **lean primary processes** to design, deliver and support this value - with minimum wasted effort and time – and the necessary **lean support processes**
- And to build a **lean management system** to develop, sustain and improve these processes over time
- Be clear about customer **Purpose**, before designing the **Processes** and then organising the **People**



Lean Principles

- Specify **value** from the standpoint of the customer (do they want goods and services or to solve their problem?)
- Identify the **value stream** for each product and remove wasted activities
- Make value **flow** towards the customer as quickly as possible
- Only at the **pull** of the customer
- While striving for **perfection** (in products and processes)

The Dynamics of Lean



No created demand amplification

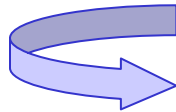
Separate capacity planning from production instructions

Combine steps where you can to flow

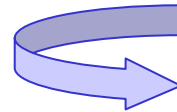
Levelled and released in small quantities

Demand signals direct from the customer's point of use

Reflexive
Pull all the way back to raw materials



Production pulled from every upstream step



To only one pacemaker process



Uninterrupted flow back to the customer's point of use

*Every Product
Every Interval
capability*

*Every step is:-
Valuable
Capable
Available
Flexible
and Adequate*

*With just the right
Standard
Inventory of:-
Cycle stock
Buffer stock and
Safety stock*

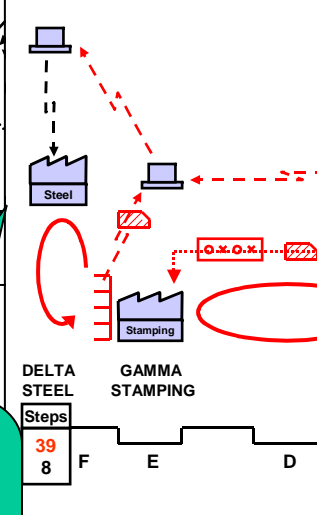
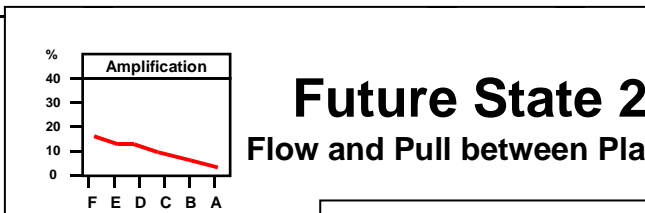
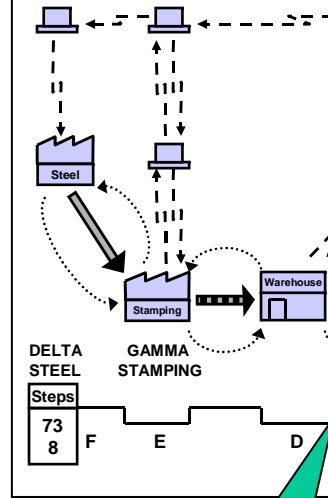
*No warehouses,
only Cross-Docks
and Mixed-model
Milk Runs*



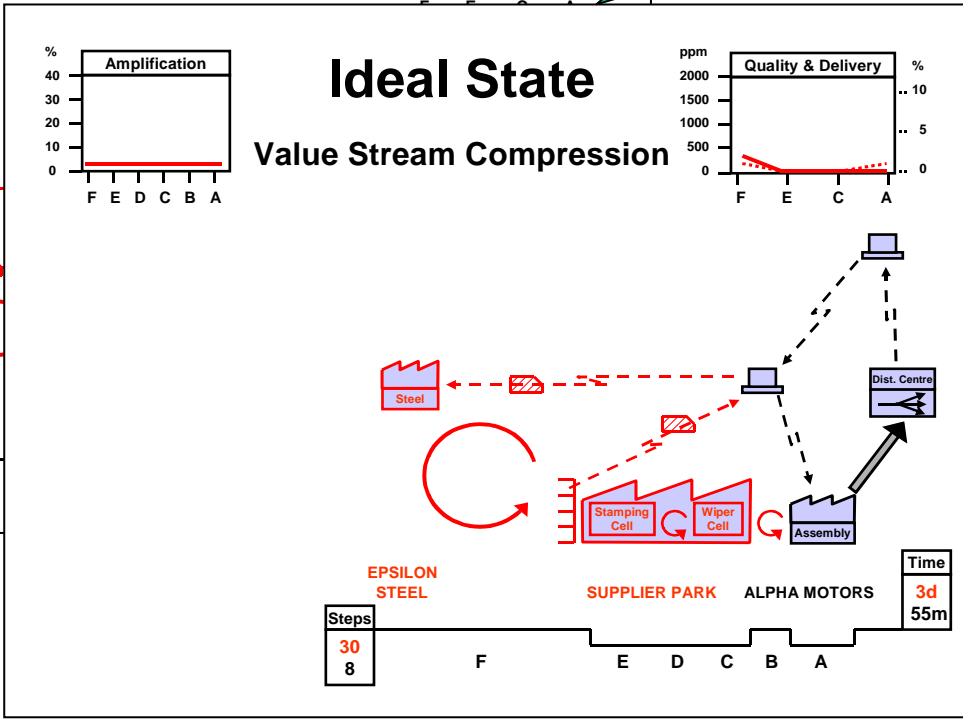
Low Volume Lean

- Lean is as relevant to **build-to-order** businesses
- The starting point may be the engineering, procurement and quotation process
- Then breaking the order down into increments of **takt time** to track progress and problems
- And modularising the elements to be produced and synchronising them
- But does the customer really need all that complexity?
- Toyota is now developing “**Lean and Simple**” equipment for use across the world

Across the Value Stream



Time reduced from 24 to 3 days



Time reduced from 44 to 24 days

Using a Common Language



Acme Stamping Steering Bracket Value Stream Improvement

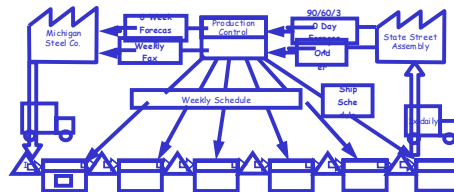
Background

- Acme supplies stamped steel steering brackets (LH & RH) to State Street Assembly. The product goes through 5 manufacturing processes & shipping.
- The customer uses 18,400 pcs/month & requires daily shipments in pallets of 10 trays of 20 brackets. A pallet is either all RH or LH.

Current Situation

- Lead time for steering bracket from coil steel to shipment = 23.6 days
- Of 23.6 days, only 188 seconds are spent making a bracket.
- Large inventories of material between each process.
- Long changeover times, downtime in welding.

Current State Map



Analysis

- Each process operates as isolated islands, disconnected from the customer.
- Push system, material builds up between each process.
- Each process builds according to its own operating constraints (changeover, downtime etc.)
- Plans based on 90 & 30 day forecasts from customer. Weekly schedule for each department. System is frequently overridden to make delivery

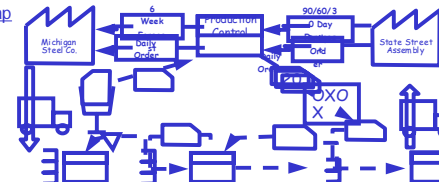
Goals

- Improve profitability of steering bracket value stream.
- Reduce lead time - 23.6 days to 4.5 days.
- Reduce inventories:
 - Stamping 7.6 days to 1 day.
 - Welding 6.5 days to 0 days.
 - Shipping 4.5 days to 2 days.

Recommendations

- Create continuous flow through weld & assembly
- Establish TAKT time. Base the pace of work through weld & assembly on customer demand.
- Set new weld - assembly cell as pacemaker for entire value stream.
- Establish EPE, build schedule for stamping based on actual use of pacemaker cell & pull steel coils from supplier based on actual usage by stamping.
- Improve uptime in weld.
- Establish material handling routes for frequent withdrawal & delivery.
- Establish new production instruction system with Levelling Box.

Future State Map



Action Plan

Deliverables	Responsible	Review
CCF at pacemaker		
Kaizen each CT to >TT		
Weld uptime to 100%		
CO reduction to < TT		
Pull at pacemaker		
FG = 2 days		
KB		
Matl handling		
Levelling Box		
Pull from Stamping		
WIP = 1 day		
CO < 10 min		
Pull from supplier		
Info flow		
Daily delivery		
RM = 1.5 days		

Follow Up

- Reviews & involvement of related departments TBD.
- Other functions: Production Control, Material Handling, Purchasing, Maintenance, Human Resources, Finance.

**For
Problem
Solving,
Managing
Projects
and
Planning**



Managing Lean

- It is not an extension of continuous improvement or a tool box – but a **system redesign** for each value stream
- Involving design & production – as well as **logistics, production control, maintenance, purchasing** etc.
- It is not about what works theoretically or automation – but a **robust system** tolerating day to day disturbances
- It will not happen unless **someone is responsible** for each **Value Stream Plan** – and unless they get the necessary support and resources from functional departments (which also means lean in every office!)

Challenges for Management



- To reconcile the **Chief Engineer's plans** for each product family with the resources required in each **function** and the **overall needs** of the business
- To move away from **centralised, cognitive** production control systems to stable levelled processes triggered by **reflexive pull**
- To spread lean across office support activities despite the resistance to **standardisation** – **lean frees up time for creativity and problem solving**

Lean Product Development



- Strong leadership from the **Chief Engineer**, drawing on resources from functional departments
- More time is spent pursuing **sets of alternatives** – so that **fewer engineering changes** are needed later
- Once agreed detailed engineering proceeds very rapidly, using standardised processes and checklists and pull communication to trigger work – a **fully industrialised design** process across every project
- Manufacturing and key suppliers are involved throughout to ensure quality and low cost – based on long term **joint product and process analysis**



Future Lean

- The **biggest gains** come from rethinking the product and the process based on the lean experience of trying to improve today's design, equipment and locations
- Toyota is targeting every new product to deliver increased functionality at **30% lower costs** – forcing step changes rather than incremental improvements
- They are also designing “**Lean and Simple**” equipment for use across the world – which is a challenge for future engineers

An Agenda for Action



- We will continue to write down the **lean knowledge** and to push the **frontiers** of lean implementation
- You need to build a much greater **pool of lean** experience in Germany – to compensate for the fact there is no Toyota plant here!
- We need to build **examples** of successful lean implementation that enable to others to see why this counterintuitive thinking works better
- The biggest challenge is to provide a **new direction** for tomorrow's engineers – **designing lean** for tomorrow's global realities



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