

The Lean Strategic Challenge

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Who am I?

- ❑ Co-author with Jim Womack of **The Machine that Changed the World** and **Lean Thinking**
- ❑ Founder of the non-profit **Lean Enterprise Academy** in the UK, and Board member of the **Lean Enterprise Institute** in the USA
- ❑ Thought leaders in spreading lean thinking across every industry, as well as services, healthcare etc.
- ❑ Researchers and publishers of the core knowledge needed to build a lean business system
- ❑ Mentor to firms experimenting at the lean frontier



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Progress so far in the US and UK

- ❑ Toyota is having a significant demonstration effect in both countries – and growing market share
- ❑ There is now a **widespread awareness** of lean and a growing pool of people with hands on lean experience
- ❑ There is **no longer a debate** that lean is the way to go – most large firms have a lean initiative going
- ❑ Growing network of **manufacturing centres** in the UK and some universities are beginning to move
- ❑ But progress is still patchy – which are hidden by a healthy economy



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Taking Stock in Autos

- ❑ Toyota is making another big push – In Europe they will challenge the **premium prices** of the Germans and hybrid will challenge Europe's strength in **diesels**
- ❑ Toyota is building a **low cost supply base** in Mexico and is challenging European & American suppliers to work with them – China is another story
- ❑ In the UK we look good in **assembly** – until you look behind this at schedule stability and the hollowed out supply base
- ❑ The challenge is to assure the long term viability of our key players



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Taking Stock in Aerospace

- ❑ Lots of effort and some progress with lean in aerospace manufacturing – but a lot more is possible
- ❑ Impressive examples of lean in **repair and overhaul** of both engines and airframes – by manufacturers and the military
- ❑ Some progress on delivering complete use packages and power by the hour
- ❑ A rapidly changing customer base wanting quite different products – and new competitors



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Taking Stock in the Process Industry

- ❑ In the UK in Steel we missed the boat on lean – while others such as Alcoa showed the way
- ❑ Chemicals has paid little attention to lean so far – though they are under pressure to deliver **little and often** – the challenge is to also make little and often
- ❑ Pharmaceuticals and food processing are now being **driven by retailers** (Tesco and Asda) reshaping distribution and demanding synchronised production – based on Lean and TPM – and not ERP systems!



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Which means

- ❑ We need to redouble our efforts to radically rethink what future customers really want
- ❑ We need to make much more progress with lean product development and lean manufacturing
- ❑ And to spread it right across the organisation to every support function and every office
- ❑ And to reshape our supply base to compress each value stream
- ❑ It all comes down to a relentless focus on **process**



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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.”

Which is why Toyota will be No 1 by 2010



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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**



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Understanding Lean

- ❑ Initially thought of as empowered teams and continuous improvement – Kaizen and TQ
- ❑ Then as a box of tools – 5S, SMED, TPM etc.- sometimes combined into a Production System
- ❑ Then as a more radical reconfiguration of individual operations – Kaikaku – all still **Point Kaizen**
- ❑ Value stream mapping introduced the visual language for **Flow Kaizen** and **System Kaizen**
- ❑ But bottom up Lean can only go so far – at some point it needs to be linked to a clear business case and led by top management – a **Lean Business System**



Where Can You Lean?

- ▼ Begin by filtering your portfolio of products or tasks
- ▼ Start to create flow on the things you do regularly:-
 - ▼ On high-volume parts with regular demand
 - ▼ Or on low volume parts made on simple tools
 - ▼ Or on the design and quotation of one-off products
 - ▼ Or on frequently performed tasks in the office
- ▼ Then work to incorporate less frequent products or tasks – modularising them, quicker changeovers, etc – while challenging the need for the long tail
- ▼ The end objective is to be able to produce to customer demand – **Every Product Every Interval**



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The Logic of Lean

Much faster response and throughput times, higher quality on time, at much lower cost

No created demand amplification

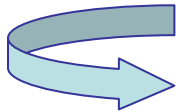
Separate capacity planning from production instructions

Combine steps where you can to flow

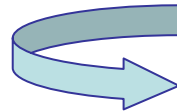
Levelled and released in small quantities

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*

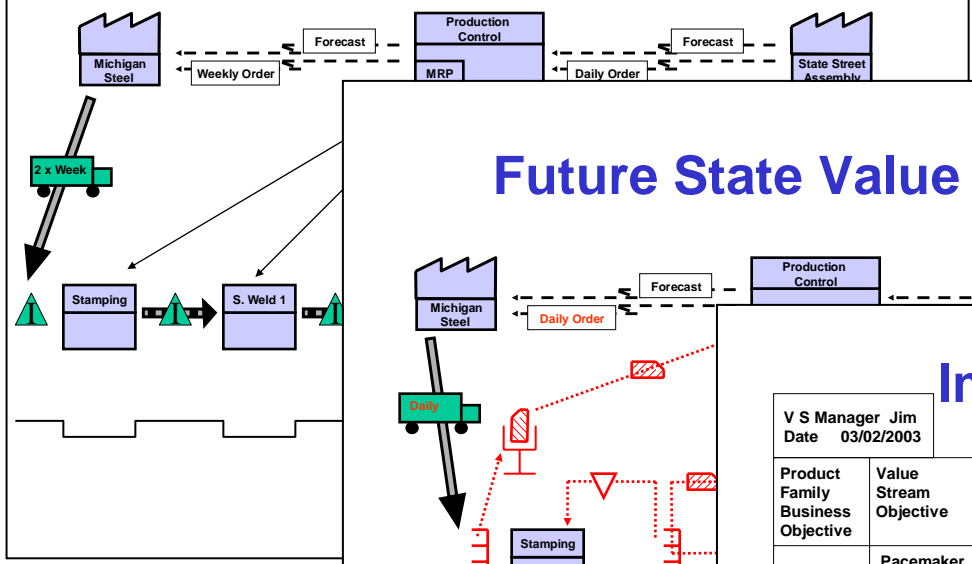


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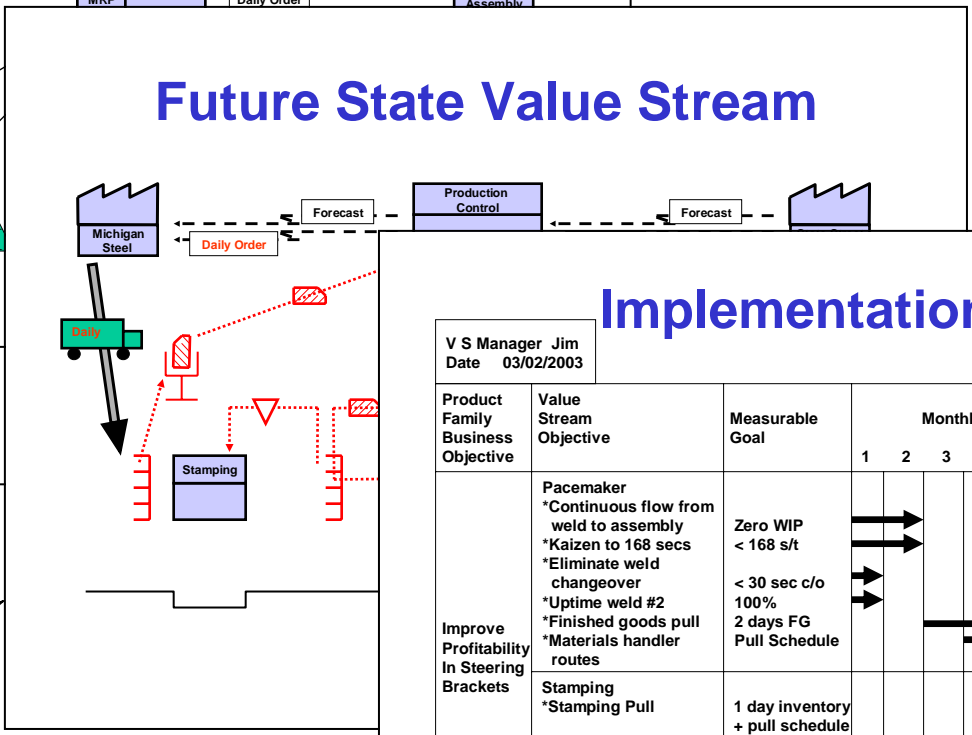
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Implementing Lean

Current State Value Stream



Future State Value Stream



Check progress and stabilise

Ask the key questions

Implementation Plan

V S Manager Jim Date 03/02/2003		Product Family Steering Brackets											
Product Family Business Objective	Value Stream Objective	Measurable Goal	Monthly Schedule									Person in Charge	
			1	2	3	4	5	6	7	8	9		
Improve Profitability In Steering Brackets	Pacemaker *Continuous flow from weld to assembly *Kaizen to 168 secs *Eliminate weld changeover *Uptime weld #2 *Finished goods pull *Materials handler routes	Zero WIP < 168 s/t < 30 sec c/o 100% 2 days FG Pull Schedule	→	→	→								John Dave Sam Mike Sue James
	Stamping *Stamping Pull *Stamping changeover	1 day inventory + pull schedule batch size 300/160 pieces c/o < 10 min				→	→						Fred Tim
	Supplier *Pull coils with daily delivery	daily delivery < 1.5 days of coils at press								→			Graham



Using a Common Language

Acme Stamping Steering Bracket Value Stream Improvement

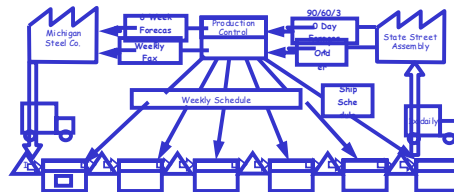
Background

- 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

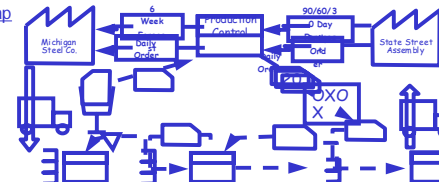
Goals

- 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 and managing projects

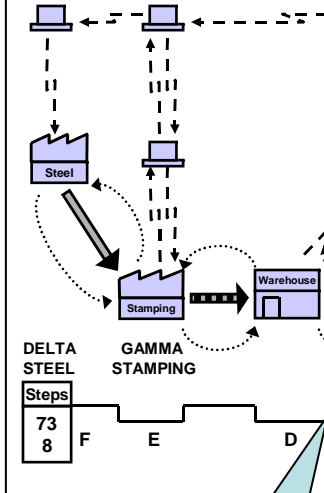
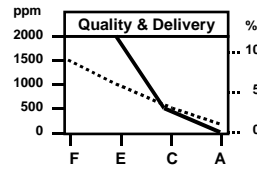
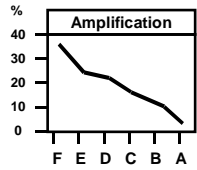


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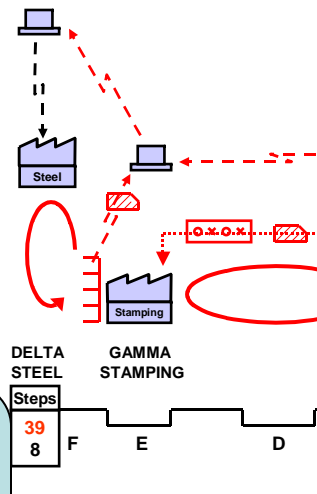
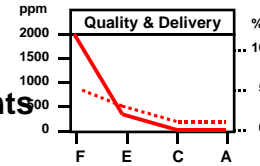
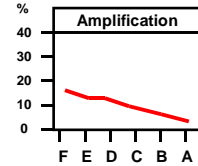
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Across the Value Stream

Current State

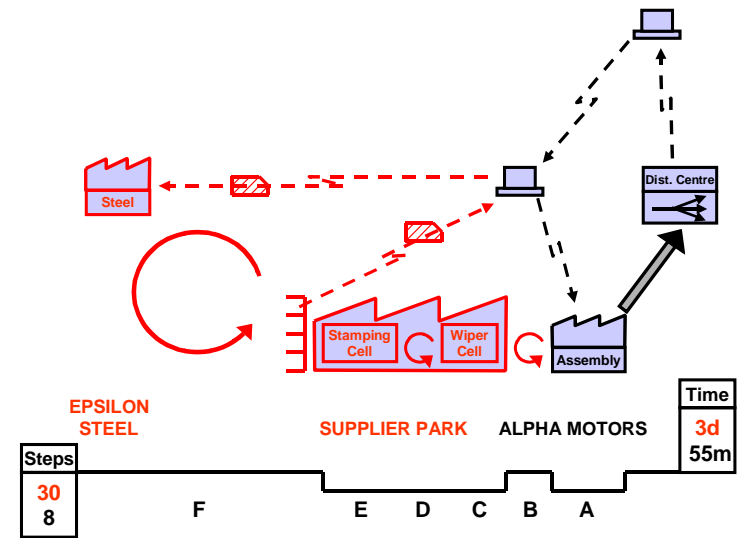
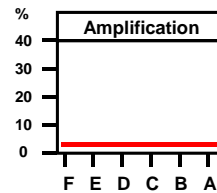


Future State 2 Flow and Pull between Plants



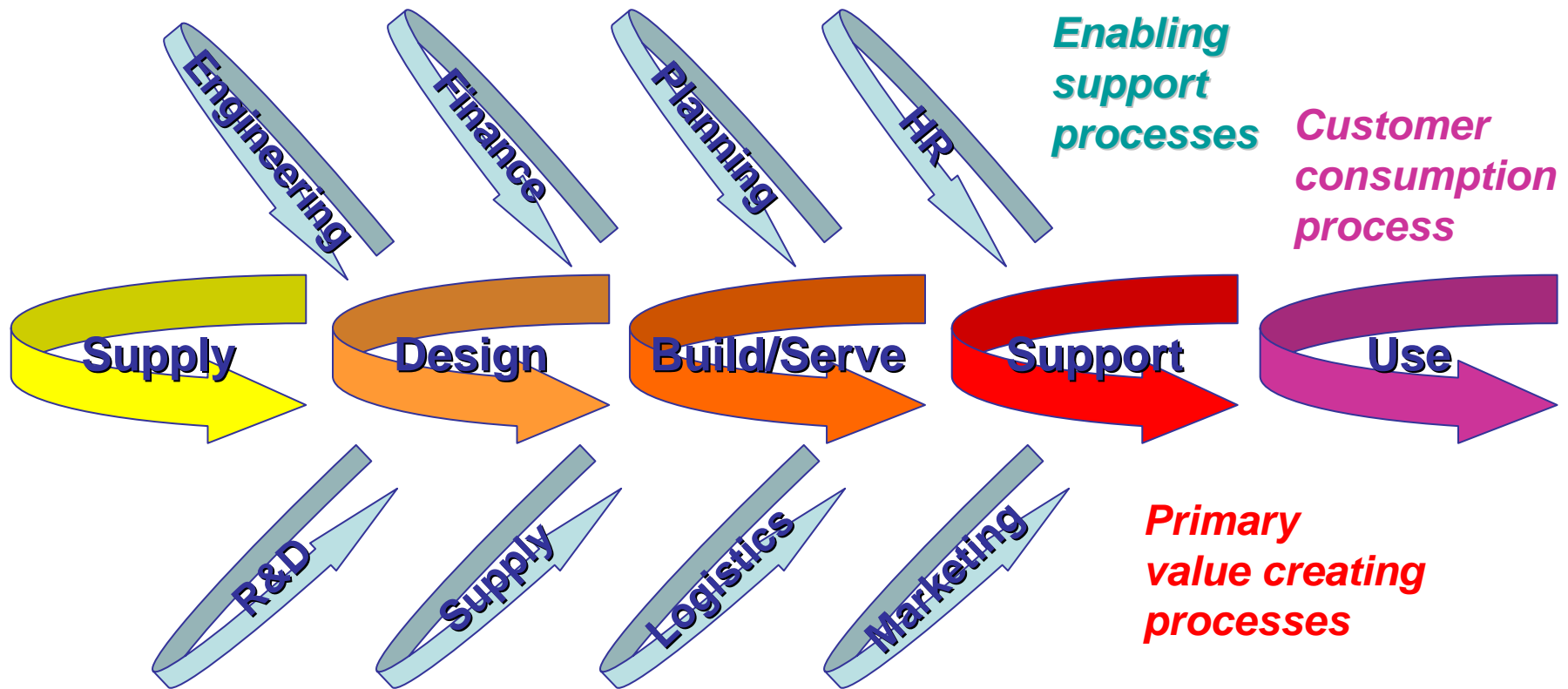
Time reduced from 44 to 24 days

Ideal State Value Stream Compression



Time reduced from 24 to 3 days

The Process Organisation



Every process has a customer – and can be leaned!



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The Next Generation

- ❑ How would you design the next generation product and the process, tooling, supply base and distribution with enhanced functionality and for 30% lower costs?
 - ❑ Designing out unnecessary steps
 - ❑ Designing right-sized tooling
 - ❑ Value stream compression with suppliers
 - ❑ Minimum costs in use through the life of the product



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Lean Business System

- ❑ Has to be built on the **Value Stream Plans** for each product family – led by the Product Line Managers or Value Stream Managers – who have lots of responsibility but little formal authority
- ❑ But these plans can only be realised using the resources of the **supporting functions** – once the needs of all the value stream plans are known
- ❑ It is top management's job to lead a **policy deployment** process to prioritise and agree the resources for these actions and to align them with the overall needs of the business



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Your Check List

- ❑ Is top management willing to lead lean?
- ❑ Is there a common way to manage lean projects – and to sustain the results?
- ❑ Is someone responsible for reconfiguring each product value stream through your facility and beyond?
- ❑ Is there an active policy deployment process based on value stream plans to prioritise and resource them?
- ❑ Is there a common language across the whole organisation for seeing processes and for root cause problem solving?



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