Lean Food Production

A Healthy Diet For Manufacturers

Prof. Thomas Neitzert
Menu

Starters  History of Lean Production
Entre     Explanation of Lean
Mains     Case studies
Dessert   Where to from here?
A short history of lean

1913  Ford Assembly Line
1950  Deming System of Profound Knowledge
       Just in Time (JIT), Jidoka (Autonomation)
1960  Total Quality Control (TQC)
1970  Total Productive Maintenance (TPM)
1978  Toyota Production System (TPS)
1980  Total Quality Management (TQM)
1986  Six Sigma (Motorola)
1988  Lean Production
Elements of lean

- Systematic elimination of waste ("muda")
- Value orientation
- Continuous flow
- Takt time
- Lot size of one
- Pull orientation
- Continuous improvement
- Respect for people
Lean tools I

7 Wastes
- Overproduction
- Motion
- Defects
- Waiting
- Inventory
- Transportation
- Extra, inappropriate processing

5 S
- Sort (or discard)
- Streamline, straighten
- Sweep, scrub
- Standardise
- Sustain
Lean tools II

• Kanban
• Single minute exchange of die (SMED)
• Visual Management
• Value stream mapping
• Systematic problem solving (Lean six sigma)
Assembly vs. process industries

• Discrete vs. continuous processes
  – Process industry ends up with discrete operations
    (Roll of paper, carton of milk, block of cheese …)
• Assembles 100+ parts vs. starts with 1 raw material
  – Process industry ends up with many products (e.g. dairy)
• Variety vs. volume
  – Hardly any car is the same amongst 6.5m Toyotas vs. Exxon’s different products from 7000 kbd of oil
• Labour intensive vs. capital intensive
  – Labour productivity vs. asset productivity
• Labour constraint vs. capital constraint
  – Extra people make a difference vs. process improvements
Case studies I

Wise Foods, USA (Salty snacks)
- Trained senior management in Lean
- Introduced SMED, waste elimination, kaizen activities, increased efficiencies, improved inventory control
- Within 3 months US$500,000 in savings documented
- Initial-year cost savings target US$1.5m
- Starting with 75 people, becoming integrated enterprise-wide initiative

Business Wire, February 2003
Case studies II

Value Stream Mapping of Contract Manufacturer
Lethinen, Torkko, Journal of Food Distribution Research, 2005

Manufacturing ketchups, mustards, sauces and jams
60 employees serving 50 customers with 280 products

Findings:
Raw material stocks turned over 3 times p.a.
End product inventory turned over 28 times p.a.

Achievements:
More frequent and leveled production runs
Simple and visual production schedule
Value enhanced services through shorter lead-times
Case studies III

Survey of improvement programs in the Canadian food sector
Scott, Wilcock, Kanetkar, Food Control 20, 2009

Most important factors found (in descending order):

- Reduction of number of deviations
- Improvement of quality performance
- Reduction of risk of product recalls
- Assistance in increasing manufacturing productivity/efficiency
- Reduction of rejected material
- Improvement of employee commitment and attitude towards change
- Assistance in becoming more customer orientated
- Reduction of risk of audit observations

Lean more dominant in publicly traded companies vs. private non-processed products vs. processed
Case studies IV

Application of lean paradigm in red meat processing
David Simons, Keivan Zokaei, Cardiff Business School, UK, British Food Journal 2005

- Effects of Takt Time and Standardised Work
- Focus on takt time improves operator activity from 60% to 80%
- Standardisation improves quality and traceability
- Higher team spirit
- Reduction of inspection
- Improved workstation lay-out
Case studies V

Lean Supply Chain Management
Ballas, J&M Consulting, Mannheim, Germany, 2008
Application at Delicatessen Manufacturer

Leveling of planning and production
Sequencing of manufacturing
Standardisation

Results:
Change-over times from 10 to 7 minutes
Reduction of finished product wastes by 20 %
Reduction of inventory by 15%
Benefits of lean (NZ)

• Tangible
  – Productivity improved by 50%
  – Inventory holdings reduced from 5-6 weeks to 2 weeks or less
  – Work in progress (WIP) reduced by 70%
  – Lead times for orders reduced from 12-17 weeks to 4 weeks
  – Projects that used to take 4 months now take 5 weeks
  – Sales up 10%
  – Grown 30% over the last four years

• Intangible
  – Allows the senior management team to ‘know’ their business better (Go to “Gemba”)
  – Mostly the staff buy in to the changes and feel like they are part of the change process
  – Relaxed staff atmosphere, less stress in the work place for staff and management
  – The physical landscape of the work place becomes much more organised, clean and aesthetically pleasing
  – Blame cultures eliminated

NZTE, Supporting Lean Manufacturing Initiatives in New Zealand, 2008
Implementation - Get Started

• Find a change agent
• Get Lean knowledge
• Find a lever
• Map your value streams
• Begin asap with kaikaku
• Expand your scope

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Implementation - Create a new organization

- Reorganize by product family
- Create Lean function
- Devise a policy for excess people
- Devise a growth strategy
- Remove anchor-draggers
- Instill a “perfection” mind-set
Implementation - Install business systems

- Introduce Lean accounting
- Relate pay to firm performance
- Implement transparency
- Initiate policy deployment
- Introduce Lean learning
- Find right-sized tools
Implementation - Complete the transformation

- Apply these steps to your suppliers/customers
- Develop global strategy
- Transition from top-down to bottom-up improvement

By end of year five
Supports

• NZTE Lean Business programme
  – Seminar for senior company managers
  – Up to $10,000 to engage a consultant to provide training and to develop implementation plan (to be matched by 50%)

• Tertiary Provider Programmes
  – Lean philosophies are incorporated into teaching programmes
  – Research students (Masters, PhDs)

• Private Providers
  – Training programmes on-site, off-site
  – Individual consultancy

• Lean Consultants and Trainers
Outlook

• Lean implementation needs stamina
  – At least 1 year with external assistance
  – Overall > 3 years horizon
• Lean supply chains will spread – adds to continuity
  – Networks/Fora
• Lean is a major tool for productivity improvements in and out of current recession
• Let’s not forget the better product, process, and equipment
• Lean leads to increased sustainability through focus on customer value and waste elimination