The Leanest Lean There's Ever Been

99% Fat Free Manufacturing

Are Lean and APS Mutually Exclusive?

The Leanest Lean

What do we mean by Lean Manufacturing?

- High Level
  - Eliminate waste (Muda)
    - Excess production/inventory
    - Unnecessary movement of people/materials
    - Excess queue time
    - *Over processsing & scrap, not relevant to Preactor*
- The Aim
  - Deliver on time, with minimum inventory, shortest lead time and highest possible utilisation

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How Do We Implement Lean?

- Major characteristics of a lean project:
  - Value Stream Mapping
  - Lean Thinking
    - Takt time (Production rate)
    - Heijunka (Load levelling)
    - Process redesign
  - Typical Implementation
    - Visual Production Control (VPC)
      - Pull system
      - Kanbans

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How Do We Implement Lean?

- Is Visual Production Control (VPC) the best way to implement Lean?
  - Many consultants see Lean and VPC as synonymous
- Let's test this by asking The Ultimate Lean Question

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The Ultimate Lean Question

If you stopped accepting orders tomorrow and then waited until your factory stopped, how much inventory would you have left?

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The Ultimate Lean Question

- The Leanest Answer is None
- If you use VPC:-
  - There will be no finished goods, but…
  - All Kanbans will be full
  - Raw material stocks will be full
- Why?

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The Ultimate Lean Question

- Because with VPC only the final assembly and dispatch are Make to Order
- All upstream processes are Make to Stock
- Kanbans are simply inventory

Brian called me a heretic for saying this!

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How Did We Get To This State?

- Before MRP we had Economic Batch Quantities (EBQ)
- MRP gave us aggregated dependent demand, but it is still an EBQ and creates inventory
- VPC reduces inventory by process change so the EBQ is one Kanban full
- But even if the Kanban quantity is one, we are still making to stock

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The Ultimate Lean Answer

- Make (Build) To Order (MTO) is the real answer
- Ideally we should have no items in the factory which have not been ordered by a client
- VPC cannot achieve this state
- We need an IT based solution to take the final Lean step

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The Ultimate Lean Answer

- Where possible turn off Make to Stock (i.e. minimum batches) in your MRP
  - This will generate many smaller orders giving a changeover frequency problem
- Mostly Make To Order and use APS to perform dynamic aggregation
  - Order or operation based aggregation
- You can now trade off changeover frequency against delivery performance & utilisation

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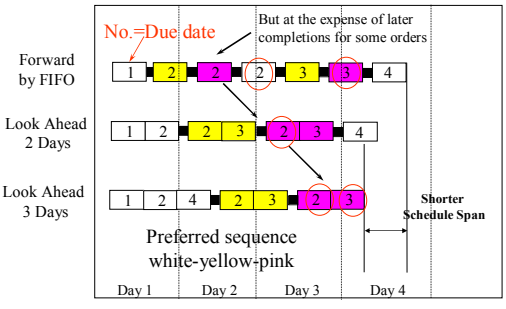
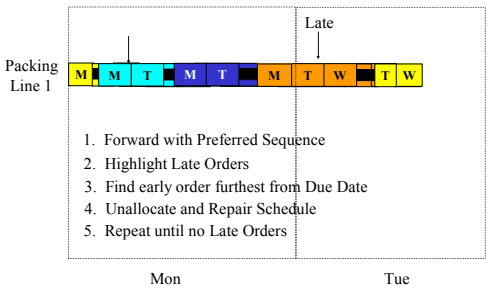
The Ultimate Lean Answer



The Leanest Lean

The Ultimate Lean Answer



The Leanest Lean

Summary

- APS and Lean are not mutually exclusive
- Value Stream Mapping (or similar) is required to identify issues
- VPC reduces inventory…
- But to get the leanest lean you NEED APS
- Those who haven't gone through the VPC stage can leapfrog it by using APS
- However…

The Leanest Lean

Empowering The Planner

- VPC devolves scheduling decisions to the shop floor
- APS empowers the planner to make scheduling decisions
- Is this a good move?

Empowering The Planner

VPC Vs APS

- VPC
  - Scheduling decisions are based on empty Kanbans
  - Working in isolation
  - No visibility of company wide KPIs (delivery performance, cost, etc.)
  - Variations in demand cause problems
- APS
  - Scheduling decisions are based on company wide KPIs
  - The planner has the whole picture
  - Allows tradeoffs between KPIs
  - Variations in demand are handled easily
  - Production has one KPI – schedule adherence

Empowering The Planner

VPC Vs APS

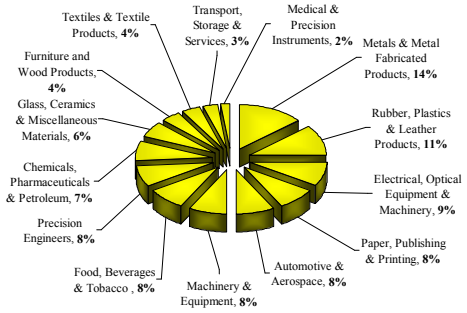
We are getting back to optimising:

Door to Door not Floor to Floor!

But is this really happening?

Empowering The Planner

Preactor is Used in a Vast Range of Industries



Empowering The Planner

Preactor is Used in a Vast Range of Industries

- This puts PI in a unique position to compare the production control techniques across sectors
- Some of these sectors (e.g. fresh food) have always had very low inventory, because of shelf life issues
- They are in the forefront of planner empowerment
- Can other sectors learn from their experience?

Empowering The Planner

Some Food Users

- Geest
- Northern Foods
- Hazelwood Foods
- Hitchin Foods
- Nestle
- Nature's Way Foods
- Plus many others around the world

Empowering The Planner

Fresh Food Process Characteristics

- Short shelf life products
- Short shelf life materials (inc packaging)
- Delivery lead time < manufacturing lead time
- Very variable demand (promotions)
- Hygiene
- Alternative BoMs
- Tough clients (shorting is a huge issue)
- Flexible labour

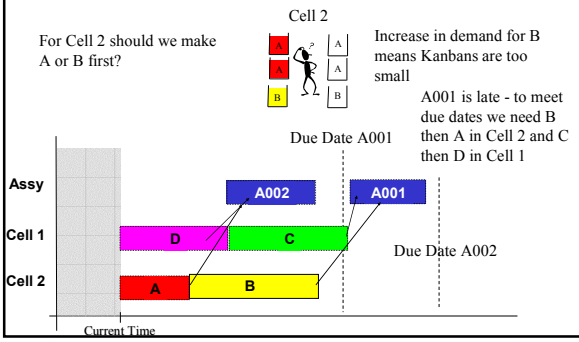
Empowering The Planner

Fresh Food has Complex Scheduling Issues

- VPC almost unknown
- In some companies the status of the planner has been raised
- APS has become 'endemic' in the company culture
- Manufacturing truly have one KPI, schedule adherence

Empowering The Planner

Demand Variation with VPC



Empowering The Planner

Demand Variations with APS

For both Cells, what should we make first?
Simply schedule by Due Date and the demand variation is automatically taken into account