The Seven Deadly Wastes

How to spot them and manage them.

The Seven Deadly Wastes

• Original 7 wastes or “Muda” developed by Taiichi Ohno
• Productivity based, but quality linked
• “Waste” is the opposite to “Value Adding”
• Should be considered as a set
• Form the core of the “lean philosophy”

So, what are they?

The Seven Deadly Wastes

(for manufacturing)

1. Overproduction
2. Waiting
3. Transporting
4. Overprocessing (or inappropriate processing)
5. Unnecessary Inventory
6. Unnecessary Motion
7. Defects
Overproduction

- Believed by Ohno to be the most serious waste because it was the root of so many problems
- Making too much, too early, or “just in case”
- Discourages the smooth flow of goods
- Leads directly to excessive lead time, storage time and storage cost

Overproduction (cont.)

- Defects may not be detected early
- Products may deteriorate in storage
- False pressures on work rate generated
- All these increase the risk of defects.

Also overproduction leads to Excessive Work In Queue/Work In Process inventories, separating processes and blocking communication

Overproduction (cont.)

- Overproduction is often the natural state
- People naturally overproduce “just to be safe”
- Output related bonus systems reinforce this
- Prevented by “Kanban” systems
- Motto is “Sell daily? Make daily!”
Waiting

- Occurs whenever time is not used effectively – a delay to value adding activities
- Any time that material is not moving or having value added is waiting
- The enemy of smooth flow
- Interrupts the rhythm of work
- May be difficult to eradicate, but the goal remains

Waiting (cont.)

- Employees waiting is also a waste, Can the time be better spent on:
  - Another operation
  - Training
  - Cleaning
  - Maintenance
  - Checking the process or equipment
  - Practicing changeovers
  - Improvement projects
  - Deliberate relaxation

Waiting at bottlenecks

- A “double crime”
- “An hour lost at a bottleneck is an hour lost for the whole plant” – Goldratt, the Goal
- Effective use of bottleneck time is key to regular production, and strongly influences productivity and quality
Waiting and customers

• Don’t keep customers waiting – eventually they will go away, this is VERY painful
• They may even be prepared to pay a premium for faster service!

Transporting

• Customers do not pay to have goods moved around
• Therefore, any movement of materials in a factory is waste
• Can’t be fully eliminated, but can be continually reduced
• Number of handling operations is proportional to risk of damage and deterioration

Transporting (cont.)

• Closely linked to communication
  – Long distances = poor communication
  – News of quality problems not fed back
• Once recognised, it can be addressed
  – Flow lengths through operations
  – Number of steps (esp. non value-adding steps)
  – Spaghetti diagram is very useful
  – Also look at customer movements
Inappropriate Processing or Overprocessing

• "Using a sledgehammer to crack a nut"
• Thinking in terms of one big machine rather than several smaller ones leads to:
  – Less operator “ownership”
  – Pressure to run the machine as often as possible rather than just when needed
  – General purpose machines not ideal for the need at hand
  – Poor layout (then transportation and communication issues)
• Ideal is to use the smallest machine capable of producing the required quality positioned at the points of use

Inappropriate Processing or Overprocessing (cont.)

• Inappropriate processing refers to machines or processes that are not quality capable
• It also refers to using people who are not “quality capable” of doing the job required. Here the important question is “Why?” Is it motivation, lack of skill or poor communication of requirements?

Unnecessary Inventory

• Inventory is the enemy because:
  – It increases leadtime (>99% of WIP is actually Work In Queue)
  – It ties up money that could be used to improve processes
  – It prevents rapid identification of problems
  – It separates process steps and reduces communication
  – Its` true cost is much higher than the money tied up in it
Unnecessary Inventory

- Inventory hides problems by covering them up
  - Quality problems seen as not important because there are always “spare” parts
  - Process reliability problems ignored because there is stock available to keep going
- Lean encourages deliberate inventory reduction to uncover problems. Cut the safety inventory:
  - If nothing happens, fine. You’ve just made things leaner
  - If a stoppage occurs, good. A problem has been recognised, you can find the root cause and fix it.

Unnecessary Motions

- This splits to 2 sections – the human equivalent to transporting, and ergonomics
  - Making people move a long way to get materials, tools or information leads to short cuts, and problems
  - If employees have to stretch, bend, pick-up, move to see better, the victim is both the operator (who gets hurt) and the company (who lose quality and productivity)

Ergonomics

- Awareness of ergonomics is both ethically and economically sound.
- Toyota encourages all employees to be aware of working conditions and to help reduce motion waste
- Video taping is a good tool to get employees to analyse and target improvements in their ergonomic issues
Defects

- Included by Ohno to “complete the set”
- Defects cost money
- Toyota view – a defect is an opportunity to improve, rather than as a trade-off (western view)
- Seeing a defect as a waste, has a lot in common with Crosby’s “Zero defect” view

New wastes

- Several people have extended Ohno’s list, here are a few additions:
  - Making the wrong product (the right way). Related to the view that Value is in the view of the ultimate customer
  - Untapped human potential
  - Inappropriate Systems and Information. Go for simple, visual systems. Like Hammer says “Don’t automate, obliterate”
  - Energy. Leaving lights or computers on when not needed is a symptom of a wider malaise

Seven Service Wastes

- Similar ideas, but from the customer’s viewpoint:
  - Delay
  - Duplication
  - Unnecessary movement
  - Unclear communication
  - Incorrect inventory
  - Opportunity lost
  - Errors