

Creating Agility to Win

FIT



FAST



FLEXIBLE



Improving Operations, Process, People and Workplace →
RESEARCH, TRAINING & IMPLEMENTATION

War on 8 Waste



VEDZEN
Fit • Fast • Flexible

▼ Learning by doing ▼ Hands on ▼ Team Based

War on 8 Wastes

LEAN Eliminates Non-value Added Activities

Value adding
Optimize

5%

Primary focus of “traditional”
efficiency improvements

Necessary but
not value adding
Minimize

35%

**Primary focus of
LEAN improvements**

Non value adding
= **WASTE**

60%

Attack the NVA first and reduce
the NVA through further improve &
eventually eliminate it completely.
A process in general has around
95% Waste in the form of NVA.



7 Classical Wastes and 1 Inherent Waste

1. Waste of Overproduction
2. Waste of Inventory
3. Waste of Transportation
4. Waste of Waiting
5. Waste of Motion
6. Waste of Processing
7. Waste of Defects & Rework
8. Waste of Employee Creativity

War on 8 Wastes



Acronym - DOWNTIME

All alphabets show a kind of Waste

- **D - Defects**
- **O - Overproduction**
- **W - Waiting**
- **N - Needless Processing**
- **T - Transportation**
- **I - Inventory**
- **M - Motion**
- **E - Employee Creativity**

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Waste of Over-Production



Over Production

Inventory

Transportation

Waiting

Motion

Processing

Defects

Employee
Potential

Definition

Producing more than is needed, faster than needed or before it is needed

Causes:

- Poor Planning
- Just-in-case Production
- Poor communications
- Processes which cannot consistently produce the Quantity or Quality required
- Lengthy Set-up and Cycle times
- Local Optimization (Production that primarily benefits a single department's interests)
- Poor equipment reliability

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Waste of Over-Production



Examples:

- “Irregular” flow of Production
- Production above target
- Excessive lead time
- Delivery too early
- Shortage of Storage space

Solution:

- Implement Pull systems (Supermarkets)
- Connect to customer
- Synchronize departments for information sharing

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Waste of Inventory



Over
Production

Inventory

Transportation

Waiting

Motion

Processing

Defects

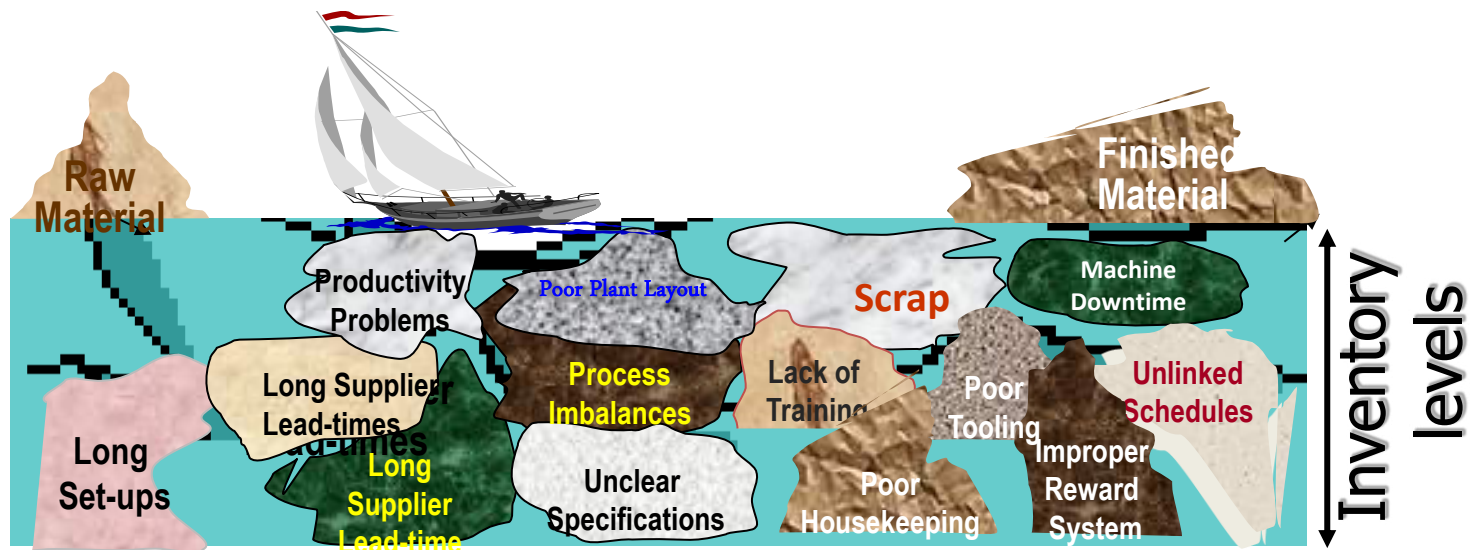
Employee
Potential

Definition

Any supply (Materials or Goods) in excess of what is required to deliver products in a Just-In-Time Manner.

Causes:

- Poor Sales Forecasting so is Inventory Planning/Tracking
- Long Process Setup and Cycle Times
- Unbalanced Production Processes
- Inconsistent Processes or Suppliers



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Waste of Inventory



Examples:

- Inventory exceeding specified quantity limit
- High inventory at workplaces doubles the handling
- Excessive safety stock
- Shortages at critical assembly line

Solution:

- Little's Law states: WIP (Work In Process) is
= Production rate (or rate of product arrivals) x Lead time
- Batch sizing or Lot Levelling
- Kanban or e-Kanban And Supermarket
- Visual Inventory Indicators

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Waste of Transportation



Over
Production

Inventory

Transportation

Waiting

Motion

Processing

Defects

Employee
Potential

Definition

Any material movement that does not directly support immediate production

Causes:

- Improper facility layout
- Large buffers and In-process Kanbans
- Large lot purchasing
- Poor production planning
- Poor scheduling
- Poor work place organization
- Inadequate material handling equipment
- No clear signals given
- Production rate is different than dispatch

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Waste of Transportation



Examples:

- Machining Area too much congested with Other Matl.
- All movements by forklift compels waiting
- Big Container for small-size Material
- Double handling for single operation
- Conveyors

Solution:

- Small-wheeled containers should replace forklifts
- Spaghetti Diagram & Problem Solving techniques
- U shaped cells with input & output demarcation
- Point of Use Storage

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Waste of Waiting



Over
Production

Inventory

Transportation

Waiting

Motion

Processing

Defects

Employee
Potential

Definition

Idle time that occurs when Operator/ Process/ Operation/ Machine cannot proceed with the next task

Causes:

- Poor equipment maintenance
- Lack of proper equipment/materials
- Long setup time or high changeover
- Lack of cross-skill exchange
- Undocumented, non-standardized work methods
- Production bottle necks
- Unbalanced production line
- Uneven distribution of training

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Waste of Waiting



Examples:

- Waiting for material to be unloaded at workstation
- Operators slower than the production line
- Operators watching machines working on a component
- Late delivery of schedule to be followed
- Queuing at a tool crib

Solution:

- Reduce queue size
- Visual production planning display
- Training within Industry (Job Methods & Description)
- Tools near the workstation
- Lean Cells for Multi-machine Single Operator

War on 8 Wastes



Waste of Motion



Over
Production

Inventory

Transportation

Waiting

Motion

Processing

Defects

Employee
Potential

Definition

Any movement of people which does not contribute added value to the product or service

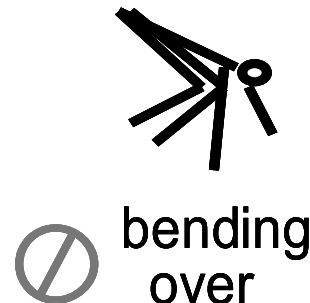
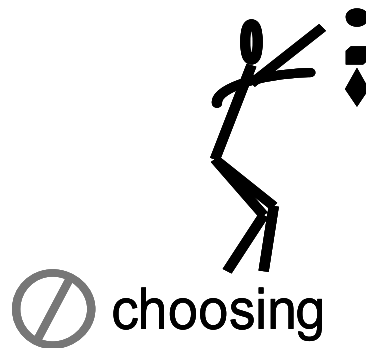
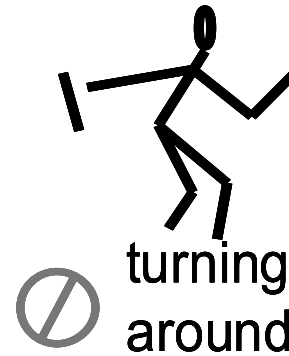
Causes:

- Ineffective equipment, office and plant layout
- Lack of Visual controls
(Printed schedules, production plans, etc.)
- Poor process documentation
- Poor work place organization
- Improper structural arrangement
- Machine layout is as per the work processes
- Atmosphere is not labor-friendly (too hot/cold)
- Unsafe work conditions (without PPE)

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Waste of Motion – Examples



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Waste of Motion – Examples



Examples:

- Bending
- Reaching out for the tools
- Double handling at the workplace
- More than two turns to grab a nut
- Walking between widely spaced work centers

Solution:

- Identify, eliminate, and control workplace through operators
- Spaghetti diagram
- Ergonomics (Scientific workstation)
- Reduce the turns, bends, searches, picks for an operation

War on 8 Wastes



Waste of Over Processing



Over
Production

Inventory

Transportation

Waiting

Motion

Processing

Defects

Employee
Potential

Definition

Unnecessary effort (production or communication) which adds no value to a product or service

Causes:

- Processing design decisions made at inappropriate levels
- Poorly documented processes
- Lack of customer input concerning requirements
- Poor configuration control
- Bogus quality standards (Not related to customer)
- No estimation of Voice of Customer
- Undue reference to old designs
- Wrong version

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Waste of Over Processing



Examples:

- Variation between skills of the operators
- Variation from standard
- Rework goes unaccounted
- Defects being reprocessed, only to create more waste
- Having to use a “fast” machine shared between several lines

Solution:

- Think “small is beautiful”. Smaller machines avoid bottlenecks, improve flow lengths, can be maintained at different times, and may improve cash flow while keeping up with technology
- Generate Voice of Customer
- Account all operations with the customer requirements

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Waste of Defects/ Rework



Over
Production

Inventory

Transportation

Waiting

Motion

Processing

Defects

Employee
Potential

Definition

Costs associated with the sorting, repairing and/ or reworking products as well as materials which have been scrapped due to defects

Causes:

- Too many product models
- High inventory levels
- Inadequate tools/ equipment
- Poor employee training
- Poor layouts/ Unnecessary handling (Transport damage)
- Poor process documentation
- Processes which cannot consistently produce the Quantity Or Quality required
- Irregular feed & speed of machines
- Non-Standard quality assurance and control

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Waste of Defects/ Rework



Examples:

- Scrap generated
- Rework due to irregular dimensions
- Less than perfect yield accepted by production
- Off-cut stashed away for future use
- Customer complaints go un-noticed

Solutions:

- Prevention prior to detection
- Quality at source – online quality
- Chain of Quality/House of Quality
- Use of Andon must be encouraged
- Autonomation (Jidoka)

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Waste of Employee Potential



Over
Production

Inventory

Transportation

Waiting

Motion

Processing

Defects

Employee
Potential

Definition

Putting more or incompetent people on a job than is needed, Tasks are not assigned as per the Abilities, Unique people competencies go unseen or misused

Causes:

- Poor recruitment – not as per JD
- Irregular production urgencies
- Poor communication (people kept in dark)
- Poor employee policies (non-inclusive)
- Lengthy decision process on improvements
- Lopsided culture, in favor of just one group at work
- Poor equipment/Tool/Material handling
- Blurred task significance
- Monotonous tasks (zero Task variety)
- Autonomy of employees is not in sync with Business Objective and the Shared Vision

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Waste of Employee Potential



Examples:

- “Continuous Improvement” ideas are ignored
- Production is the only priority
- Excessive/Recessive work load – month end syndrome, catering to emergencies/fire-fighting
- Involvement in process is not appreciated
- Absence of reward and punishment

Solution:

- Implement systems for people through Lean Kaizen Workshop
- Connect everyone’s role with the Business objective and Shared vision - Create opportunities for Leadership & Personal growth
- Synchronized space for expression of Employee Creativity with daily work with apt Appreciation

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Basic Principles for War on Waste

1. When you can't go under, go Over it.
2. When you can't go left, go by right. If you can't get an angle, get two plates and weld it.
3. Throw out all your fixed ideas about how to do things.
4. Think of how the new method will work-not how it won't.
5. Don't accept excuses. Totally deny the status quo.
6. Don't jump to perfection. (A 50 % implementation rate is fine as long as its done on the spot.)
7. Spend very little money on improvement.
8. Problems gives you a chance to use your brain.
9. 10 brains are better than one person's excellence.
10. Improvement knows no Limits.

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Thank You!



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