

SEE WASTE CLEARLY.

Using IIoT to Reveal and Remove the 8 Wastes

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Smart Lean

“Making hidden waste visible in modern manufacturing”

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Why This Matters



Manufacturing Is Changing Faster Than Our Eyes Can Track

Industry Reality

- High-mix manufacturing is becoming the norm
- Observation alone is no longer enough
- Automated systems generate massive data
- Hidden waste exists in physical and digital processes
- IIoT helps reveal waste in real time

Industry Data

- Downtime can be reduced by up to 50%
- Maintenance costs reduced by 18-25%
- Faster response to process deviations

Lean Still Matters More Than Ever

- Technology does not replace Lean thinking
- IIoT helps reveal waste faster
- Data alone does not solve problems
- Human interpretation is still critical
- Automating a bad process only creates faster waste



“Don’t automate waste. Understand it first.”

IoT VS IIoT

IoT

Consumer-focused

Smartwatch

Alexa

Smart thermostat

Convenience

Lifestyle improvement

IIoT

Industrial-focused

Machine sensors

Connected equipment

Real-time dashboards

Process visibility

Productivity & operational improvement

Sensors are simply tools. IIoT is the strategic use of those tools to drive smarter industrial decisions.

What Is MUDA?

- MUDA is the Japanese term for waste (8 Deadly Wastes)
- Waste = Any activity that consumes resources but does not add value
- Lean focuses on identifying and eliminating waste

Waste exists in:

- Physical activities
- Information flow
- Machine behavior
- Process variation and data trends

“Customers only pay for value-added activity.”

The 8 Wastes of Lean (DOWNTIME)

| | |
|----------|----------------------|
| D | Defects |
| O | Overproduction |
| W | Waiting |
| N | Non-Utilized Talent |
| T | Transportation |
| I | Inventory |
| M | Motion |
| E | Excessive Processing |

“IIoT helps us detect many of these wastes faster, earlier, and more consistently.”

IIoT + Lean = Smart Lean

- IIoT does not replace Lean – it enhances it
- Lean identifies what waste matters
- IIoT helps reveal waste faster and in real time
- Data helps expose trends, deviations, and hidden inefficiencies

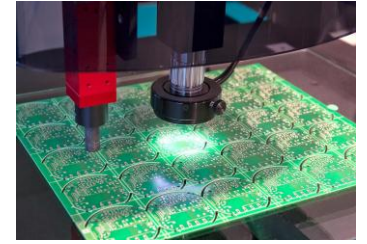
Smart Lean combines:

- People
- Process
- Real-time visibility



Technology without Lean thinking can automate waste faster.

Defects + IIoT



Errors, scrap, rework, or anything requiring correction.

Waste Examples

- Scrap/rework
- Solder defects
- Incorrect assembly
- Process variation

IIoT Visibility

- AOI systems
- Real-time monitoring
- Smart feedback loops
- Predictive analytics

Benefits

- Faster detection
- Reduced rework
- Better quality
- Improved flow

Modern manufacturers are shifting from reactive inspection to real-time quality visibility.

The faster abnormalities are detected, the faster flow can recover.

Overproduction + IIoT



- **Producing** more, sooner, or faster than what is needed by the next process or customer.

Waste Examples

- Excess finished goods
- Large batch production
- Excess WIP
- “Just in case” production

IIoT Visibility

- Real-time dashboards
- Smart scheduling
- Live WIP tracking
- Demand analytics

Benefits

- Reduced inventory
- Better flow
- Lower storage costs
- Faster response to demand

Producing more than needed often creates more **waste**, not more value.

Waiting Waste + IIoT



Idle time when people, machines, materials, or information are waiting for the next step.

Waste Examples

- Machine downtime
- Waiting for maintenance
- Bottlenecks
- Long changeovers

IIoT Visibility

- Downtime dashboards
- Predictive maintenance
- Real-time monitoring
- Andon alerts

Benefits

- Reduced downtime
- Faster response
- Improved flow
- Increased uptime

Machines may stop for minutes, but the impact can last for hours.

Non-Utilized Talent + IIoT



Failing to fully use employee knowledge, skills, creativity, and problem-solving ability.

Waste Examples

- Operators excluded from improvements
- Known workarounds
- Frontline knowledge not captured
- Data not interpreted properly

IIoT Visibility

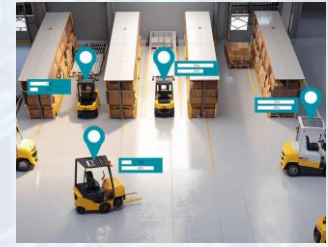
- Shared dashboards
- Real-time data visibility
- Trend identification
- Team collaboration tools

Benefits

- Better engagement
- Faster problem-solving
- Better decisions
- Stronger CI culture

IIoT may reveal the signal >>> but people still solve the problem.

Transportation Waste + IIoT



Unnecessary movement of materials, products, or equipment between processes.

Waste Examples

- Excess forklift travel
- Poor layout flow
- Multiple staging areas
- Double handling

IIoT Visibility

- Forklift tracking
- RFID tracking
- Material heat maps
- Real-time flow visibility

Benefits

- Better flow
- Reduced travel
- Less handling
- Improved layout decisions

If material travels too much, waste travels with it.

Inventory Waste + IIoT



Excess raw material, WIP, or finished goods beyond what is needed.

Waste Examples

- Excess WIP
- Overstocked materials
- Hidden buildup
- Obsolete inventory

IIoT Visibility

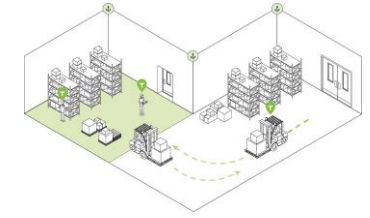
- RFID tracking
- Smart Kanban systems
- Real-time WIP monitoring
- Inventory dashboards

Benefits

- Reduced inventory
- Better flow
- Faster visibility
- Improved scheduling

Excess inventory often hides deeper process problems.

Motion Waste + IIoT



Unnecessary movement by people that does not add value.

Waste Examples

- Excess walking
- Reaching/bending
- Searching for tools
- Poor workstation setup

IIoT Visibility

- Motion tracking
- Ergonomic monitoring
- Heat maps
- Workstation analytics

Benefits

- Reduced fatigue
- Better ergonomics
- Improved layout
- Increased productivity

Small movements repeated thousands of times become major waste.

Excessive Processing + IIoT



Doing more work than the customer requires

Waste Examples

- Redundant inspections
- Excess approvals
- Re-entering data
- Repeated adjustments

IIoT Visibility

- Process dashboards
- Automated collection
- Process analytics
- Parameter monitoring

Benefits

- Faster flow
- Less manual tracking
- Better consistency
- Reduced redundancy

More process does not always create more value.

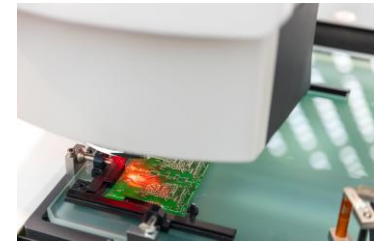
Human Know-How Still Matters



- IIoT shows what is happening
- People still determine why it is happening
- Data alone does not solve problems
- Lean thinking is still required
- Human experience helps identify:
 - physical waste
 - process abnormalities
 - statistical trends
 - root causes

The most advanced manufacturing systems still depend on human understanding and continuous improvement thinking.

Real-World Example: Smart Solder Adjustment



AOI (Automated Optical Inspection) detected excessive solder paste during PCB assembly.

Traditional Approach

- Defects discovered later in production
- Operators manually investigate
- Process adjustments made after defects increase
- More rework and downtime
- Larger batches potentially affected

Smart Lean / IIoT Approach

- AOI detects abnormal solder conditions in real time
- System sends feedback to stencil printer
- Printer auto-adjusts paste volume automatically
- Defects reduced earlier in the process
- Faster correction and less rework

The goal is not smarter machines alone — it is smarter process control.

Key Takeaways



- Lean thinking still matters
- IIoT enhances visibility — it does not replace people
- Modern manufacturing creates both physical and digital waste
- Real-time data helps reveal hidden inefficiencies faster
- Human interpretation is still critical for problem-solving
- Don't automate waste — understand and eliminate it first

Ask yourself:

- Are we collecting the right data?
- Are we reacting fast enough to abnormalities?
- What waste is currently hidden in our process?
- Where could better visibility improve flow?
- Are we solving root causes or reacting to symptoms?

•Smart Lean = People + Process + Real-Time Visibility

The goal of Smart Lean is not more technology — it is better visibility into waste and faster improvement.


Thank You!



Share your feedback

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