

"Lean, On Me"

Free Resource Notebook by Jay Watson

Name: _____

**Participant Guide
Lean Enterprise Foundations**

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Lean Enterprise Foundations**

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REDUCE DOWNTIME: Identify Specific Wastes and Improve Business Processes

When starting process improvement; it's important to identify wasted resources in general. Resources are the money consumed in financial and material resources, the waiting time between or during process operations, and the waste of intellect and knowledge required to make poorly designed or uncontrolled processes actually work.

By definition, 'Lean' process improvement means reducing the resources consumed from receipt of an order to delivery of the product or service to a customer. The Japanese word 'Muda' defines categories of waste more specifically, which – with addition of underutilized people – can be easily remembered with the acronym "DOWN TIME" ...

Defects

Overproduction

Waiting

Not-necessary - Excess processing, Mass Inspection, Adjustment, Alignment etc

Transportation

Inventory

Motion

Employees underutilized

Frontline associates need to quickly understand and apply Lean Thinking (adding value) to their day-to-day activities. As many of these employees are in departments where staffing has already been cut to a minimum, it's important that any training or process improvement workshops in which they are involved are based on continuous quality improvement principles.

Begin Mapping Process Steps and Brainstorm Activity of Waste Identification

- Every process mapping session should have about four to six attendees including management and front-line staff. Start each session with brainstorming to identify issues of impediment: wastes causing downtime, and of concern to each attendee.
- These are described as those activities that waste time, cause frustration, or seem pointless - and that removing them would make processes safer, faster, cheaper and more reliable.
- Instruct participants to write their known issues, one per yellow sticky note. Ask them to work in silence for a few minutes, then group similar ideas.
- As process steps are laid out on flipchart, add the appropriate waste(s) to the map.

These become the identified issues to be addressed in the AS IS and TO BE process analysis that will follow. Sessions typically run one to two hours in duration depending on the complexity of the process under review. Follow-up sessions focus on streamlining.

In summary, to ensure that resources of time, material, money, and intellect are only applied where they add value, we need to identify where they are being wasted. Attack those steps with the most waste first and develop an action plan for follow-up.

CONCEPT 1 VALUE STREAM MAPPING (VSM)

KEY POINT

A value stream is all the actions (both value added and non-value added) currently required to bring a product (or transaction) through the main flows essential for every product/ service: from raw material/ (customer need), through all the required steps, and then – back to the arms of the customer

STEPS

- 1. Always map in pencil - rough out 1st, clean later**
- 2. Start at the customer and work backwards**
- 3. Don't be too detailed at first, list major process steps**
- 4. Walk the actual material and information flows yourself**

Note: Start with a quick walk, to get a feel for the flow and sequence then, go back and talk to the right people for each step. (Don't forget second and third shifts)

- Color Code the operations. (Red, Yellow, Green)
- Add cycle time, wait time, travel time, quantities, yields, inventory, and number of machines/ operators required
- Always collect 'current-state' information while walking along the actual pathways of material and information flows
- Map current and future state. (With Timelines and Target Dates)
- Involve the Management team totally

ADDITIONAL RESOURCES

Lean Thinking

Learning to See

Training To See Kit (lean.org)

NOTES

What is Value Stream Mapping?

Value Stream Mapping is a tool used to create a material and information flow map of a product or processes. This powerful tool allows companies to map the flow of products in the back door as raw material, through all manufacturing process steps, and off the loading dock as finished product. This is the Value Stream. You begin the journey with the current state map - it shows you where you are. Then, you plan your lean journey with a future state map - it shows you where you're going and how you're going to get there based on your Value Stream Map, you can streamline work processes, thereby cutting lead times and reducing operating costs.

Benefits

- "See the flow" of your value stream and wastes in the flow
- View all products from a system perspective
- Draw both material and information flows of your value stream
- Draw a blueprint for lean transformation - the Future State
- Prioritize activities needed to achieve the Future State

CONCEPT 2

Value-Added Flow Analysis (VA/ FA)

KEY POINT

A Group of Lean Practices (using rigor and discipline) which evaluates the individual steps or activities in a process to determine if they ‘add value’ to the output

STEPS

- 1. Define and describe process to be analyzed**
 - Project charter, Clearly define goals
 - Cost benefit analysis
 - Signatures – Champion, Controller, Belt (minimum)
 - Time Frame for completion
- 2. Map the process and determine major and minor activities**

Start with the customer

 - Customer – receiving department of an output, the next person in line, or the (external) Customer
 - Conduct detail inquiry of what occurs
 - Use investigative questions
- 3. Identify value-added activities or processes**

Utilize investigative questions

 - What does it do? Why does it work?
 - What must it do or accomplish?
 - How does it relate to other systems, units, or components?
 - What requires this step to be done?
- 4. Calculate the time spent on value-added activities or processes (Value Stream Map)**
 - Spread Sheet Analysis (VA to NVA ratios)
 - Time-Value Analysis

ADDITIONAL RESOURCES

Creating a Lean Culture

eValueStream Mapping (lean.org)

NOTES

What is a Lean Enterprise? (Value added)

A Lean Enterprise produces more with existing resources by eliminating non-value added activities. Manufacturers are facing increased worldwide competition and the stakes are high. The winners in this competition work to eliminate overproduction caused by traditional scheduling systems and only make what customers want when they want it.

Lean establishes a systematic approach to identifying, eliminating these wastes and creating 'flow' throughout the whole company. It also helps you develop and implement a long-term plan to streamline your operations for success.

Benefits

- Reduce cycle time
- Reduce inventory
- Reduce Work-in-Process (WIP) Reduce costs
- Increase capacity
- Improve lead times
- Increase productivity
- Improve quality
- Increase profits

CONCEPT 3

5S (Sort, Set-in-Order, Shine (or scrub), Standardize, Sustain)

KEY POINT

5S system provides a basis for being a world-class competitor and the foundation for a disciplined approach to the workplace

STEPS

- 1. Separate the necessary from the unnecessary**
- 2. Straighten and put in place**
- 3. Shine (or scrub)**
- 4. Standardize**
- 5. Sustain**

ADDITIONAL RESOURCES

5S for Operators Learning Package

5S for Operators – 5 Pillars of the Visual Workplace

The 5S for the Office Users Guide

5S Garage (DVD)

NOTES

What is the 5S System?

The 5S System is a series of activities designed to improve workplace organization and standardization. These five activities, all of which begin with the letter S, include:

1. Sort through all items and remove unneeded items
2. Set in order remaining items, set limits, create temporary location indicators
3. Shine or clean everything and use cleaning as inspection
4. Standardize the first three S's by implementing visual displays and controls
5. Sustain the gains through self-discipline, training, communication and total employee involvement

Benefits

- Improve quality
- Achieve work standardization
- Decrease changeover time
- Improve safety
- Reduce storage costs
- Reduce cycle time
- Reduce machine down time
- Boost employee morale as well as work environment

CONCEPT 4

TPM (Total Productive Maintenance)

KEY POINT

Operations maintains its own equipment - utilize a 7-step plan* to attack 6 major losses

- **Downtime Losses**
 - (1) Equipment failures
 - (2) Set-up and adjustments

- **Speed Losses**
 - (3) Idling and minor stoppages
 - (4) Reduced speed (actual operating vs. designed)

- **Defect Losses**
 - (5) Defects in process
 - (6) Reduced yield between start of production and stable production

STEPS

- 1. Initial clean-up (External)**
- 2. Stop sources of defects (External)**
- 3. Standards Formulation**
- 4. Overall Checkup (Internal)**
- 5. Autonomous Checkup**
- 6. Orderliness and Tidiness**
- 7. “All out” Autonomous Management**

ADDITIONAL RESOURCES

TPM for Supervisors

TPM Team Guide

TPM for Every Operator

Practical TPM

TPM for the Lean Factory

*Source: Japan Institute of Plant Maintenance

NOTES

What is Total Productive Maintenance (TPM)?

Total Productive Maintenance (TPM) is a process to maximize the productivity of your equipment for its entire life. TPM fosters an environment where improvement efforts in Safety, Quality, Delivery, Cost and Creativity are encouraged, through the participation of all employees. The goal of TPM is to maximize your Overall Equipment Effectiveness (OEE) and to reduce equipment downtime to zero while improving quality and capacity.

Benefits

Typical manufacturing operations have experienced improvements in the following areas in a relatively short period of time (6-12 months) through the implementation of TPM:

- Overall Equipment Effectiveness (capacity) improvement of 25-65%
- Quality improvement of 25-50%
- Maintenance expenditure reductions of 10-50%
- Percent planned vs. unplanned maintenance increase of 10-60%

CONCEPT 5
VISUAL MANAGEMENT

KEY POINT

Visual Management drives Self-controlling, Self-correcting Work Areas

STEPS / LEVELS

- 1. Share Information**
- 2. Share Standards at the Site**
- 3. Build Standards into the Workplace**
- 4. Warn about Abnormalities**
- 5. Stop Abnormalities**
- 6. Prevent Abnormalities**

ADDITIONAL RESOURCES

Seeing Is Believing: New Art of Visual Management ...

The Visual Factory: Building Participation through Shared ...

Visual Controls: Applying Visual Management to the Factory

NOTES

What is Visual Management?

Visual Management / Visual Factory is the sharing of information in simplistic ways through the use of color, symbols, and pictures leading to employee involvement and self-directed work teams.

Benefits

- Clear visual instructions leave no room for confusion, interpretation or ambiguity.
- Instructions are easier-to-read, easier-to-use, easier-to-follow, and harder to get wrong.
- Right-first-time assembly with fewer errors or omissions reduces re-work time.
- Issues that aren't usually identified until the product reaches the market are eliminated, reducing warranty costs.
- Lower inspection costs, as less testing and checking are required

CONCEPT 6

QUICK CHANGE-OVER / SET-UP REDUCTION / SMED

KEY POINT

Single Minute Exchange of Die

Ideally, set-up time should be anything less than 10 minutes ...

STEPS

- 1. Observe and document the current set-up**
- 2. Separate Internal and External elements**
- 3. Improve each element**
- 4. Observe and document the new set-up process**
- 5. Standardize the new set-up procedure**
- 6. Celebrate!**

ADDITIONAL RESOURCES

Set-up Reduction: Saving Dollars with Common Sense

Set-up Reduction: Shorter Lead time, Lower Inventories ...

A Revolution in Manufacturing: The SMED System

Kaizen for Quick Changeover: Going Beyond SMED

Quick Changeover Simplified

NOTES

What is Setup Reduction?

Setup Reduction builds on the principles of the Single Minute Exchange of Die (SMED) system, developed by Shigeo Shingo, to dramatically reduce or eliminate changeover time. The six-step Changeover Improvement Process is used to help companies design no/low cost solutions to reduce changeover time. This, in turn, allows the firm to meet customer demands for high-quality, low -cost products, delivered quickly and without the expense of excess inventory.

Benefits

- Respond to customer needs and schedules with more flexibility
- Improve on-time delivery
- Decrease costs due to excess inventory
- Increase line and machine capacity levels
- Increase changeover accuracy
- Reduce startup defects

CONCEPT 7

J.I.T. / CELLULAR CONCEPTS

KEY POINT

JIT (Just-In-Time) = Manufacture most economically

- **Only what is needed/ sold now**
- **Only in the amount needed now**
- **Only when it is needed**

STEPS

- 1. Walk the process**
- 2. Process Map**
- 3. Collect process data**
- 4. Label as value-added or non-value added**
- 5. Calculate TAKT time (Available hours / Customer demand)**
- 6. Graph Operational times classified as value-added and non-value added**
- 7. Remove or reduce non-value added steps**
- 8. Challenge whether value-added steps are really value-added**
- 9. Develop new layout or process (flow)**
- 10. Level the load and determine the work sequence**

ADDITIONAL RESOURCES

JIT Implementation Manual–6 Volume Set (Productivity Press)

NOTES

What is J.I.T. / Cellular Manufacturing?

Cellular manufacturing helps build a variety of products with as little waste as possible. Equipment and workstations are arranged in a sequence that supports a smooth flow of materials and components through the process, with minimal transport or delay.

When processes are balanced, the product flows continuously and customer demands are easily met. Cellular/Flow Manufacturing is the linking of manual and machine operations into the most efficient combination of resources to maximize value-added content while minimizing waste. The most efficient combination implies the concept of process balancing. Only in a balanced process will the product continually flow. As a result, parts movement is minimized, wait time between operations is reduced, inventory is reduced and productivity increases.

Benefits

- Maximize value added by each worker
- Minimize part movement and inventory
- Reduce lead times, cycle times and waiting times
- Increase productivity and quality performance
- Free up floor space
- Improve efficiency of cross-training workers
- Increase communication

CONCEPT 8

PULL SYSTEM / KANBAN

KEY POINT

- **An Information System That Signals the Need To Start An Event (i.e. - Flow of material or information)**
- **Name For Each Individual Signal (Card or Otherwise)**

STEPS

- 1. Control The Flow of Production by Providing Information Which Interconnects Upstream And Downstream Processes At Every Level**
- 2. Develop “Rules” of the Kanban**

Implementation:

- **Usually A Piece Of Paper in a Vinyl Envelope Or Container**
- **Outline Markings On The Floor**
- **Most Common Is Two - Bin System**

ADDITIONAL RESOURCES

Creating Level Pull

Kanban for the Shop Floor

Custom Kanban: Design a System to Meet the Needs of ...

NOTES

What are Pull System / Kanban?

Pull System / Kanban control the flow of resources in a production process by replacing only what has been consumed. They are customer order-driven production schedules based on actual demand and consumption rather than forecasting. Implementing Pull Systems can help you eliminate waste in handling, storing and getting your product to the customer.

Benefits

- Reduce overall inventory
- Reduce work in process
- Reduce order turnaround time
- Increase customer satisfaction
- Improve cash flow
- Reduce cycle time
- Reduce machine down time
- Boost employee morale as well as work environment

CONCEPT 9

MISTAKE PROOFING (POKA-YOKE)

KEY POINT

Mistakes can be eliminated through the use of devices (*poka-yoke*) that are used to either detect or prevent defects from occurring in the first place

STEPS

- 1. Identify and Describe the defect/ red flag condition**
- 2. Determine root cause (where the defect is discovered or where it is made)**
- 3. Detail the sequence of events in the documented standard procedure**
- 4. Review the steps that differ from the standard**
- 5. Identify the mistake-proof device type required**
- 6. Create device(s) and test for effectiveness**

ADDITIONAL RESOURCES

Mistake-Proofing for Operators Learning Package

Mistake Proofing for Operators: The ZQC System

Poka-Yoke: Improving Quality by Preventing Defects

NOTES

What is Mistake Proofing?

Mistake proofing (or as it's more commonly known Error Proofing) is about preventing mistakes from disrupting production or wasting staff time in rectifying mistakes. Mistakes may still happen, but through using error proofing techniques the chances of them occurring (and time spent rectifying them) is greatly reduced.

Although the ultimate aim of mistake proofing is to get rid of mistakes, the secondary aim is to manage mistakes when they happen, before they can affect productivity and efficiency!

Benefits

- Ensures that a number of processes can be substantially reduced
- Operators are able to operate more efficiently
- Much less time is spent rectifying defective goods

CONCEPT 10

On-going Continual Improvement (KAIZEN methodology)

KEY POINT

Basic Philosophy Is to Involve All Employees in Small, Daily Improvements within their Work Areas

STEPS

- 1. Determine Areas of Improvement**
- 2. Document current state (performance)**
- 3. Identify and Track Improvement Actions**
- 4. Prioritize Actions**
- 5. Test/ Pilot/ Verify Solutions**
- 6. Complete Final Report-out to Management and Sponsors**

ADDITIONAL RESOURCES

Implementing Kaizen: The Core of Toyota's Lean Skill Set
Kaizen Express
Breakthrough Kaizen Events (DVD)

NOTES

Why Do A Kaizen Blitz?

The Kaizen Event methodology has been used extensively for improving the organization of work in factories and actual methods used to manufacture products. The results are real-time with implementation occurring within one week. Not only will you obtain immediate improvements to your process, you will also develop a list of other improvement opportunities that your staff can investigate and implement after the Kaizen Event. The Kaizen Event will provide your company with immediate tangible results and motivation or ongoing continuous improvement within your company.

Benefits

- Immediate results
- Involvement of the workforce
- Visual, action orientation
- Can use ongoing, once learned concepts
- Fosters communications
- Creative vs. capital investments
- People think from "business" perspective
- Implementation smooth due to TEAM concept

NOTES

NOTES

Jay Watson

A Businessman, Lean Practitioner, Author, Educator, and acclaimed Speaker, Jay is an accomplished Operations and Quality Improvement Management Coach. With success from Manufacturing to Service industries - his mission: sharpen the leadership focus toward continually improving Safety, Quality, and Speed of execution imperatives.

For over 30 years, Jay Watson, a leading expert in Lean Six Sigma improvement methodologies, has assisted organizations around the world in realizing substantial and sustained quality and productivity gains through the steadfast and systematic application of lean management methods. Coupled with Hoshin Planning upfront and an effective Change Acceleration Process, positive outcomes with sustained results are inevitable. Able to work effectively with all levels in an organization, he offers a lifetime of proven and practical management approaches to operational excellence for those seriously interested in reducing waste and wasteful practices.

Under contract with Honeywell, Jay assisted a group of Black Belts/ Lean experts with a Kaizen-based initiative resulting in over \$2.1 million productivity gains.

With the Flowserve Corporation in Irving, TX, he was responsible for supplementing the corporate Six Sigma initiative with Lean Enterprise philosophies. Duties also involved mentoring executives, coaching project champions, and certifying Black Belts and Green Belts throughout the North American operations.

Working at key Customer sites with General Electric (Operation Services), his responsibilities included coaching newly trained Black Belts and Master Black Belts in the structure and discipline of six sigma techniques. Contribution from projects earned, on average, over \$120,000 each. Duties also involved conducting train-the-trainer sessions and providing on-site assistance within the areas of project definition, belt development and overall program design and deployment. He was cited for assisting development in one of the finest Lean Six Sigma training programs at GE.

A veteran within Industrial, Manufacturing and Quality Engineering, Jay has provided strategic and tactical leadership for a variety of performance oriented projects - including: union wage incentive programs, production cost reductions, employee suggestion systems, quality control circles, supplier development and business process management improvement. Because of these efforts - organizations experience increased safety performances, decreased lead times, improved cycle times, product and process defect reductions, and greatly enhanced customer and employee satisfaction measures.

For over a decade, Jay managed a successful TQM consulting firm and taught part-time with several leading universities and colleges in Phoenix, Arizona. As a top corporate educator, he was also associated with Motorola University West - where he received the coveted CEO Quality Award in 1993 for Six Sigma development and deployment efforts.

He earned university degrees in Human Resource Development, Business Administration, and Engineering Technology.