



PDHonline Course P212 (12 PDH)

Introduction to Lean Principles and Practices

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PDH Online | PDH Center

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History:

- Henry Ford credited with starting original movement
- Kiichiro Toyoda and Taiichi Ohno: 1930's developed the Toyota Production System.
- Popularized by Jim Womack, author of *Lean Thinking, The Machine that Changed the World* and *Lean Solutions*

Why Use Lean?

Lean principles help to examine business processes and focus on minimizing unnecessary costs, reducing waste and improving inefficient procedures.

Benefits:

- Identifies problem areas and bottlenecks
- Increases business efficiencies – make sure staff time is spent on value-added activities.
- Save money – reduce overhead in paperwork
- Simplify processes
- Conform to rules & regulations and codes of conduct – standardizing processes using Lean

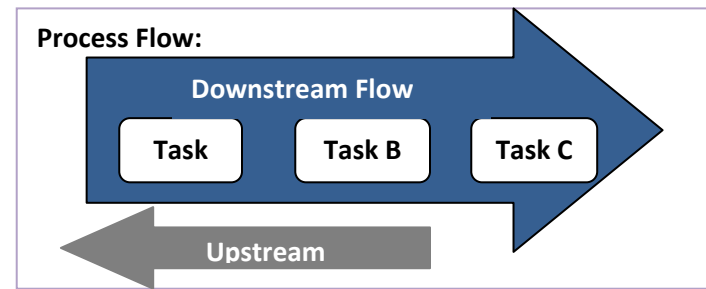
What is Lean?

Lean consists of proven tools and techniques that focus on minimizing wasteful activity and adding value to the end product to meet customer needs. The 8 areas of waste can be used to understand the inefficiencies:

Waiting	Inventory	Under	Correction / Rework
Overproduction	Motion	Material Movement / Transportation	Extra Processing

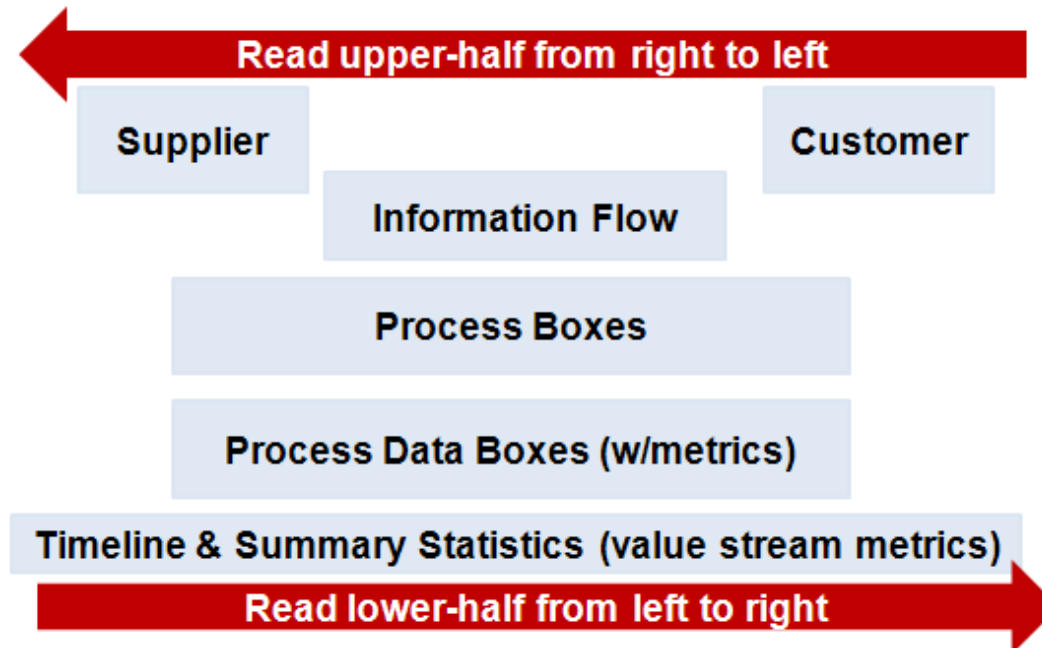
A mapping method called Value-Stream mapping is typically used to capture the “current state” process, including both the value-added and non-value added steps. Value-stream mapping provides an overall view of business processes as they are now, mapping the material and information flows and can be used to create the “future state” process after the “leaning” has taken place.

Introduction to Lean Principles



Look at process through the customer's perspective and identify "waste" in the process.

A VSM is a **simple tool** that visually represents what's going on in a value stream



Lean Terminology/Metrics:

Non-value added: Activities or actions taken that add no real value to the product or service, making the activity or action a form of waste.

Value-added: Activities or actions taken that add real value to the product or service.

Incidental Work: Activities needed to stay in business legally.

Internal Customer: Receiver of the product or service inside the organization, often the individual downstream process.

External Customer: Receiver of the product or service outside the organization.

Kaizen Philosophy: Japanese for “improvement” or “change for the better”. Frequent small improvements, the cycle is:

- Standardize an operation
- Measure the standardized operation
- Gauge measurements against requirements
- Innovate to meet requirements and increase productivity
- Standardize the new, improved operations

Lean Metrics:

1. **Process Time (P/T)** – actual “touch time” of one work item; exclude interruptions
2. **Delay Time (D/T)** – time work item is delayed or not touched
3. **Lead Time (L/T)** – start time to finish time; $L/T = P/T + D/T$
4. **% Complete and Accurate (%C/A)** - % of work entering a process that is complete and accurate.

Understanding 8 Areas of Waste:

WAITING:

- System downtime or response time
- Approvals from others
- Information from customers
- Meetings starting late
- Late reports, paychecks, or projects

INVENTORY: Too much of anything and any form of batch processing

- Excessive office supplies
- Full “in-boxes” (electronic or paper)
- Computer files never used

UNDERUTILIZATION OF PEOPLE

- Limiting employee authority and responsibility for tasks
- Inadequate business tools available
- Delaying implementation of computer system components
- Restricting or not offering training on technical resources

CORRECTION/REWORK: Correction of any error

- Order entry errors
- Grammar and punctuation
- Inaccurate reports or data
- Lack of standardized work
- Incomplete communications

OVERPRODUCTION: Producing more sooner or faster than is required for the next process

- Printing hardcopies of forms
- Purchasing items just in case they are needed
- Processing paperwork before the next person in the process is ready
- Preparing reports that are not used or read

MOTION: Unnecessary physical movement

- Copy machine too far away from users
- Digging through stacks of paper
- Reaching for commonly used tools
- Misplacing equipment/items
- Using too many layers for electronic folders

MATERIAL MOVEMENT/TRANSPORTATION (transporting, sorting, or arranging items unnecessarily)

- Filing papers that will never be used again
- Stock piling supplies far from their point of use
- Burying extra supplies in drawers or storerooms
- Requiring multiple approvals
- Hand Delivery
- Late reports, paychecks, or projects

EXTRA PROCESSING: Extra mental or physical non-value added steps

- Producing repetitive documents from scratch
- Poor filing system
- Lack of visual controls
- Too many approvals required for action
- Unclear reports/memos published
- Reviewing a document multiple times to determine action
- Meetings without agendas for action

WASTE WALK

Audit questions to determine “pain points” in an area to be Leaned

<p>WAITING</p> <ol style="list-style-type: none"> 1. Are there excessive signatures or approvals required? 2. Is there too much dependency on others to complete a task? 3. Are there delays in receiving information? 4. Are there computer program version problems causing delays? 5. System downtime or response time causing delays? 6. Are there cross-departmental resource commitment issues? 	<p>OVERPRODUCTION –</p> <ol style="list-style-type: none"> 1. Are making extra copies, more than needed? 2. Are we printing, faxing, e-mailing more than what is needed? 3. Are we entering repetitive information on multiple work documents or forms? 4. Are we ordering more tests or services than what is required by the customer? 5. Are we purchasing items just in-case they are needed? 6. Are we preparing reports that are not used or read? 7. Are we having meetings without the necessary information for action?
<p>INVENTORY –</p> <ol style="list-style-type: none"> 1. Are files (or work) awaiting excessive signatures or approvals? 2. Are files awaiting task completion by other? 3. Are there delays in receiving information? 4. Are we purchasing excessive supplies of any kind? 5. Do we have any obsolete files (electronic or hardcopy) in the area? 6. Do we have obsolete equipment in the area? 7. Is there batch processing of transactions or reports? 	<p>MOTION –</p> <ol style="list-style-type: none"> 1. Are you searching for computer files on your desktop or using too many layers for electronic folders? 2. Are you searching for work documents (files) in cabinets and/or drawers? 3. Are you constantly reviewing the same manuals for information? 4. Are you hand-carrying paper work to another process or department regularly? 5. Are you misplacing equipment/items? 6. Are you reaching for commonly used tools?
<p>UNDERUTILIZATION OF PEOPLE –</p> <ol style="list-style-type: none"> 1. Are we in positions we were trained to do? 2. Can we assist other areas when work is slow in an area? 3. Can we be trained to do more within the organization? 4. Are the business tools adequate for the job? 5. Are you restricting or not offering training on technical resources? 6. Are you delaying implementation of computer components or software? 	<p>MATERIAL MOVEMENT/TRANSPORTATION –</p> <ol style="list-style-type: none"> 1. Are you delivering documents that are not required? 2. Are you doing excessive filing of work documents or filing documents that will never be used again? 3. Are you requiring multiple approvals? 4. Are you hand delivering items that can be sent in interoffice mail?
<p>CORRECTION/REWORK –</p> <ol style="list-style-type: none"> 1. Do we have any data entry errors? 2. Do we have pricing, quoting, billing, or coding errors? 3. Do we forward partial documentation? 4. Do we ever lose files or records? 5. Do we ever encounter incorrect information on a document? 6. Is there a lack of standardized work? 	<p>EXTRA PROCESSING –</p> <ol style="list-style-type: none"> 1. Are we producing repetitive documents from scratch? 2. Do we have a poor filing system? 3. Is there a lack of visual controls? 4. Are we too many approvals required for action? 5. Are we entering repetitive information? 6. Are we doing more work than is required for that process?

5S ORGANIZATION SYSTEM

Tool to organize spaces and introduce Lean concepts

Description of conducting 5S improvement: Sort, Set in Order, Shine, Standardize, Sustain	Audit questions for 5S area. Ratings: No problems – 0, 1 problem – 1, 2 problems – 2, 3 problems – 3, and 4 or more problems -4. Goal is to have a low total number. Correct problems immediately.
<p>SORT – When in doubt, sort it out!</p> <p>Ask questions about use Set Criteria for sorting Place items in holding until all have had a chance to review items being discarded</p>	<p>---- Excess/unneeded equipment, tools, furniture in area</p> <p>___ Unneeded/outdated items on walls</p> <p>___ Items are present in aisle ways, corners, etc.</p> <p>___ Excess/unneeded inventory, supplies, material in area</p>
<p>SET IN ORDER – A place for everything and everything in its place!</p> <p>Identify location for items Relocated items Use visual controls – labels Logical design flow</p>	<p>___ Correct places for items are not clearly marked or labeled</p> <p>___ Items are not marked or labeled with “return addresses”</p> <p>___ Aisle ways, workplace, equipment locations are not marked</p> <p>___ Items are not put away immediately after use</p> <p>___ Height and quantity limits are not clearly marked</p>
<p>SHINE – Inspection through cleaning!</p> <p>Clean Organize loose cords Replace damaged items Place small items on trays for easy cleaning</p>	<p>___ Floors, walls, stairs, and surfaces are dirty</p> <p>___ Equipment is dirty</p> <p>___ Appropriate cleaning materials are not available in area</p> <p>___ Lines, labels, signs, etc. are dirty and hard to see</p> <p>___ Other cleaning problems are present</p>
<p>STANDARDIZE – Everything in a state of readiness!</p> <p>Rules to maintain and control system (checklist, audits, and visual controls) Minimum and maximum limits Quick reference checklist</p>	<p>___ Standards to maintain sort and set in order do not exist</p> <p>___ Checklist for all cleaning and maintenance jobs do not exist</p> <p>___ Standards are not visible in the area and know to area stakeholders</p> <p>___ Quantities and limits cannot easily be seen</p> <p>___ Items needed to do job function cannot be located in 30 seconds</p>
<p>SUSTAIN – Training, reinforcement and measurement!</p> <p>Communicate importance Train on rules Share success in meetings Effective visual controls</p>	<p>___ Workers in area have not been trained in 5S</p> <p>___ Daily 5S was not done this week</p> <p>___ Personal belongings cannot be easily stored</p> <p>___ 5S checklist/standards are not available or up-to-date</p> <p>___ Scheduled 5S audits have not been completed this week</p>