**Introduction to Lean Principles**

**Process Flow:**
- **Downstream Flow**
  - Task
  - Task B
  - Task C
- **Upstream**

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.

**Wait:**
- 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 supplier supplies far from their point of use
  - Carrying extra supplies in drawers or storerooms
  - Moving supplies
  - 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

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**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 standard 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 (NC/A) = % of work entering a process that is complete and accurate.

**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:

- **Overproduction** vs. **Motion**
- **Material Movement / Transportation** vs. **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.

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**Understanding 8 Areas of Waste:**

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

WAITING
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 project program version problems causing delays?
5. System downtime or response time causing delays?
6. Are there cross-departmental resource commitment issues?

INVENTORY –
1. Are files (or work) awaiting excessive signatures or approvals?
2. Are files awaiting task completion by another?
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?

UNDERUTILIZATION OF PEOPLE –
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?

OVERPRODUCTION –
1. Are you making extra copies, more than needed?
2. Are you 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?

MOTION –
1. Are you searching for computer files 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?

MATERIAL MOVEMENT/TRANSPORTATION –
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?

CORRECTION/REWORK –
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?

EXTRA PROCESSING –
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.

SORT – When in doubt, sort it out!
Ask questions about use
Set Criteria for sorting
Place items in holding until all have had a chance to review items being discarded

SET IN ORDER – A place for everything and everything in its place!
Identify location for items
Relocated items
Use visual controls – labels
Logical design flow

SHINE – Inspection through cleaning!
Clean
Organize loose cords
Replace damaged items
Place small items on trays for easy cleaning

STANDARDIZE – Everything in a state of readiness!
Rules to maintain and control system (checklist, audits, and visual controls)
Minimum and maximum limits
Quick reference checklist

SUSTAIN – Training, reinforcement and measurement!
Communicate importance
Train on rules
Share success in meetings
Effective visual controls

----- Excess/unneeded equipment, tools, furniture in area
____ Unneeded/obsolescent items on walls
____ Items are present in aisle ways, corners, etc.
____ Excess/unneeded inventory, supplies, material in area
____ Correct places for items are not clearly marked or labeled
____ Items are not marked or labeled with “return addresses”
____ Aisle ways, workplace, equipment locations are not marked
____ Items are not put away immediately after use
____ Height and quantity limits are not clearly marked
____ Floors, walls, stairs, and surfaces are dirty
____ Equipment is dirty
____ Appropriate cleaning materials are not available in area
____ Lines, labels, signs, etc. are dirty and hard to see
____ Other cleaning problems are present
____ Standards to maintain sort and set in order do not exist
____ Checklist for all cleaning and maintenance jobs do not exist
____ Standards are not visible in the area and know to area stakeholders
____ Quantities and limits cannot easily be seen
____ Items needed to do job function cannot be located in 30 seconds
____ Workers in area have not been trained in 5S
____ Daily 5S was not done this week
____ Personal belongings cannot be easily stored
____ 5S checklist/standards are not available or up-to-date
____ Scheduled 5S audits have not been completed this week

Designed by Alexis Naiknimbalkar, CSU Quality Initiatives, permission required for duplication outside of the CSU system (anak@calstate.edu)