Introduction to Lean Principles

**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 and standardize processes
- Allow us to be better stewards of our resources

**What is Lean?**
Lean consists of proven tools and techniques that focus on minimizing wasteful activity and adding value to the end product to best meet customer needs. The 8 areas of waste can be used to understand the inefficiencies (see section on the right).

Lean process improvement aligns with the Deming (or Shewhart) Cycle of Plan → Do → Study or Check → Act, in that it focuses on frequent, small and continuous improvements. See illustration of cycle at right.

Flowcharting can be used as a tool to help map the current state of a process and also to map the ideal process. In addition, practitioners, can use an A3 Template as a way of working to ensure that their improvement plans are actually solving the original problem and will meet the customers needs.

**Lean Terminology**

- **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

Adapted from original designed by Alexis Nakievskaya, CSU Quality Initiatives, permission required for duplication outside of the CSU system (nakievskaya@csu.edu).
Further refined by Marie Logan, Director BAS Operations & Resource Mgmt, UC Santa Cruz

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-bows" (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
- Filing 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 piles supplies for 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 agenda for action
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 computer 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 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?

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?

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?

OVERPRODUCTION –
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?

MOTION –
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?

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 handing delivering items that can be sent in interoffice mail?

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 there 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

OVERPRODUCTION –
1. Excess/unnecessary equipment, tools, furniture in area
2. Unnecessary/obsolete items on walls
3. Items are present in aisles, ways, corners, etc.
4. Excess/unnecessary inventory, supplies, material in area

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

SET IN ORDER (STRAIGHTEN) – A place for everything and everything in its place!
Identify location for items
Relocated items
Use visual controls – labels
Logical designation 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

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

Adapted from original designed by Alexis Nejenskiuk, CLII Quality Initiatives, permission required for duplication outside of the CIQ system (inquiry@ciqstate.edu)
Further refined by Marie Logan, Director GIS Operations & Resource Mgmt, UC Santa Cruz