

MAKING STANDARD WORK STICK

Lean Six Sigma and Training Within Industry
Chris Lindstrom, Ceptara Corp.



Lean - 5S Exercise

- In consecutive order, i.e. 1 to 50, circle each number on the sheet and record how long it took to circle all 50 numbers.
 1. Start the timer
 2. Circle 1, 2, 3, 4, ... 50
 3. Stop the timer
 4. Write down how long it took in minutes & seconds

09

Circle each number in ascending order, record how long it takes.

11

45 14 5 25 37 1 16

39 10 22 28

18 20 7 9 41

2 24 15 17

13 42 12 27 29 21

30 23 35 38 19

34 93 31 32 43 4 47 49 40

3 33 44 6 8 48

46

Circle each number in ascending (1, 2, 3, ...50) order, record how long it takes.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

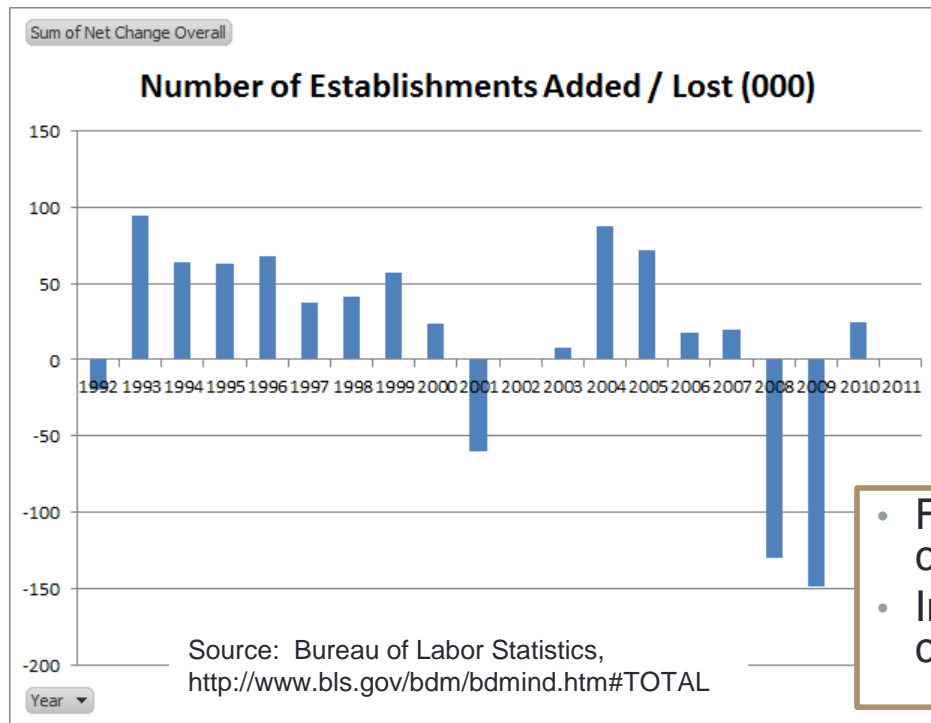
Lean 5S Methodology

— Sort, Straighten, Shine, Standardize, Sustain

Introduction

- Christopher Lindstrom
 - Managing partner at Mill Creek based Ceptara Corporation.
 - Ceptara, established in 2002
 - Helps organizations grow revenues, reduce costs and delight customers through management consulting, business coaching, quality training and productivity tools utilizing Lean Six Sigma and project management experts.
 - Experience
 - Over 20 years of management experience with technology companies such as AT&T, T-Mobile, Lucent, NCR, DEC/HP and Microsoft and a several small (< \$50M) organizations (for profit and non-profit).
 - Certified Lean Six Sigma Master Black Belt and senior member of American Society for Quality.
 - Master's of Science degree in Electrical and Computer Engineering from the University of South Carolina with an emphasis in neural networks and artificial intelligence.
 - Bachelors of Science degree in Electrical Engineering from the University of Nebraska.

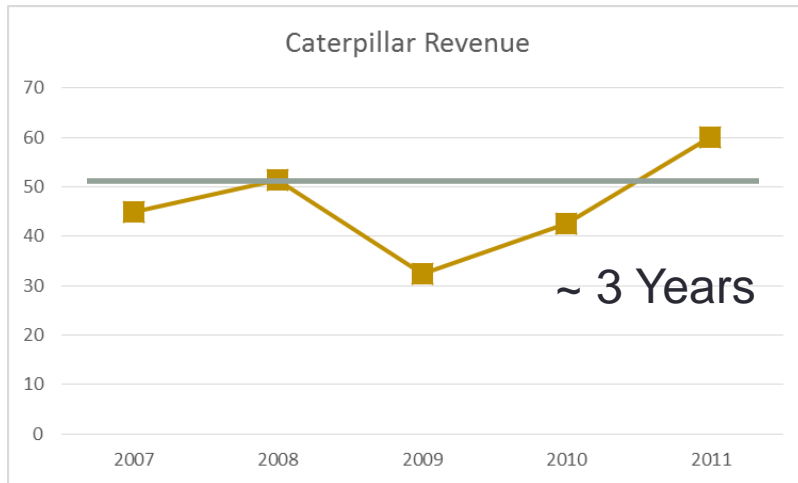
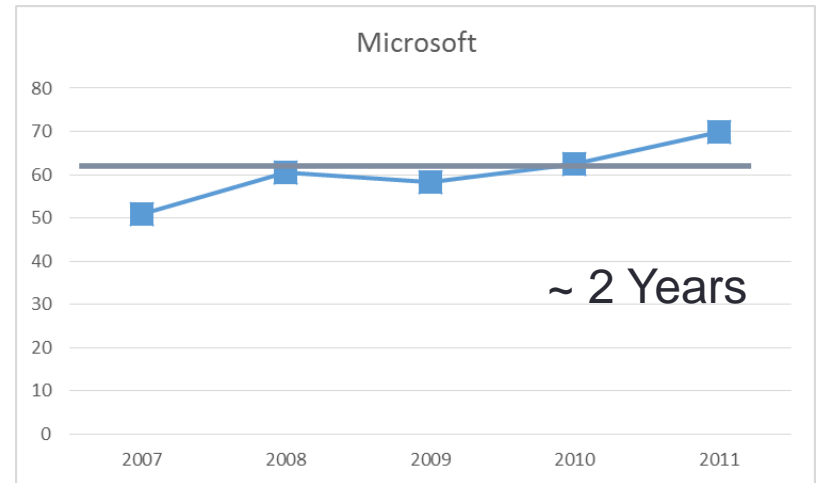
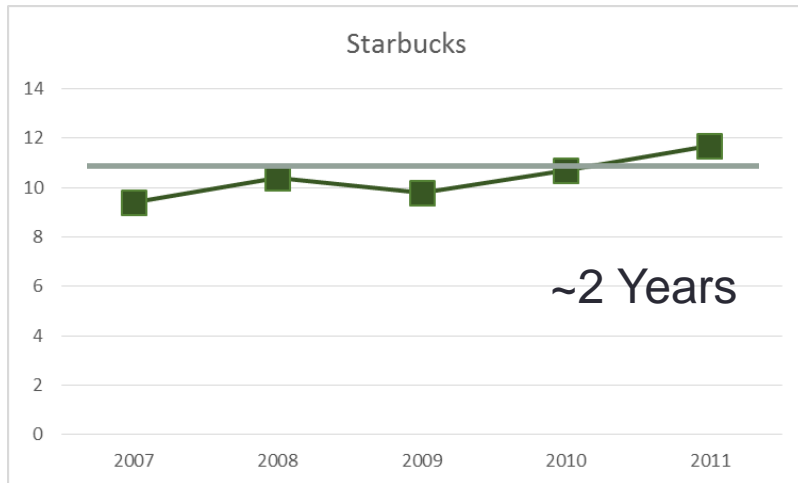
Organizational Challenges



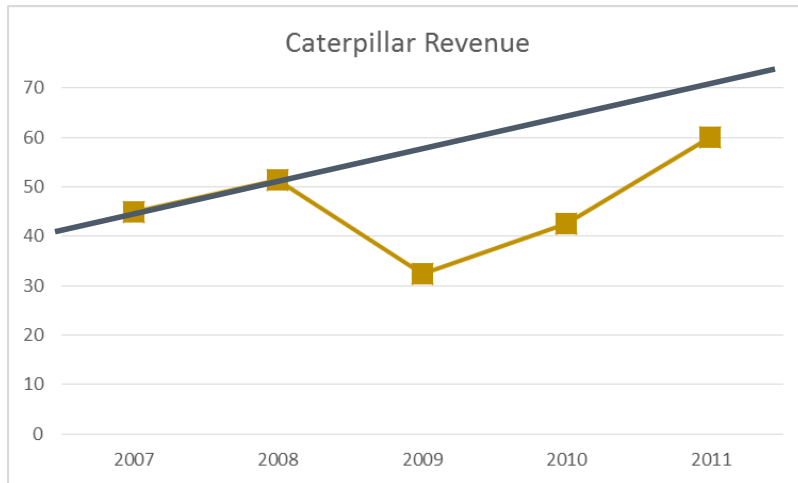
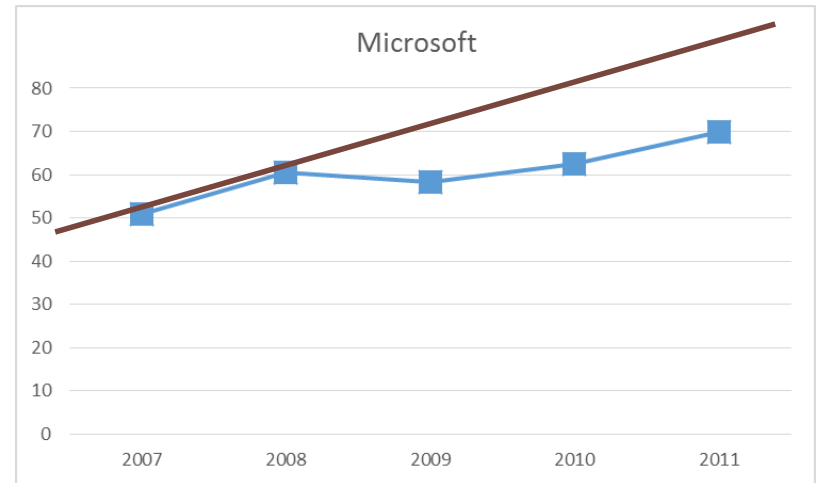
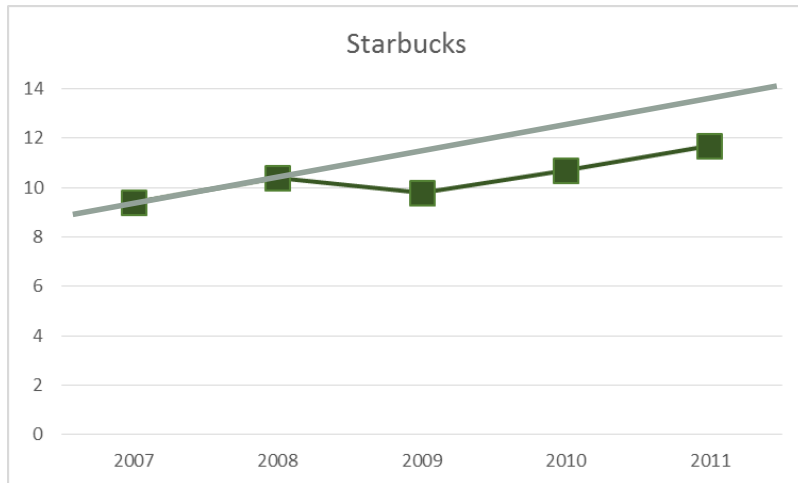
- From 2003 to 2008 the U.S. added ~40k companies (establishments) per year
- In 2008 and 2009, the U.S. lost ~130k companies per year

Could an ‘excellent’ organization have avoided the ‘Great Recession’?

Some Large Companies...

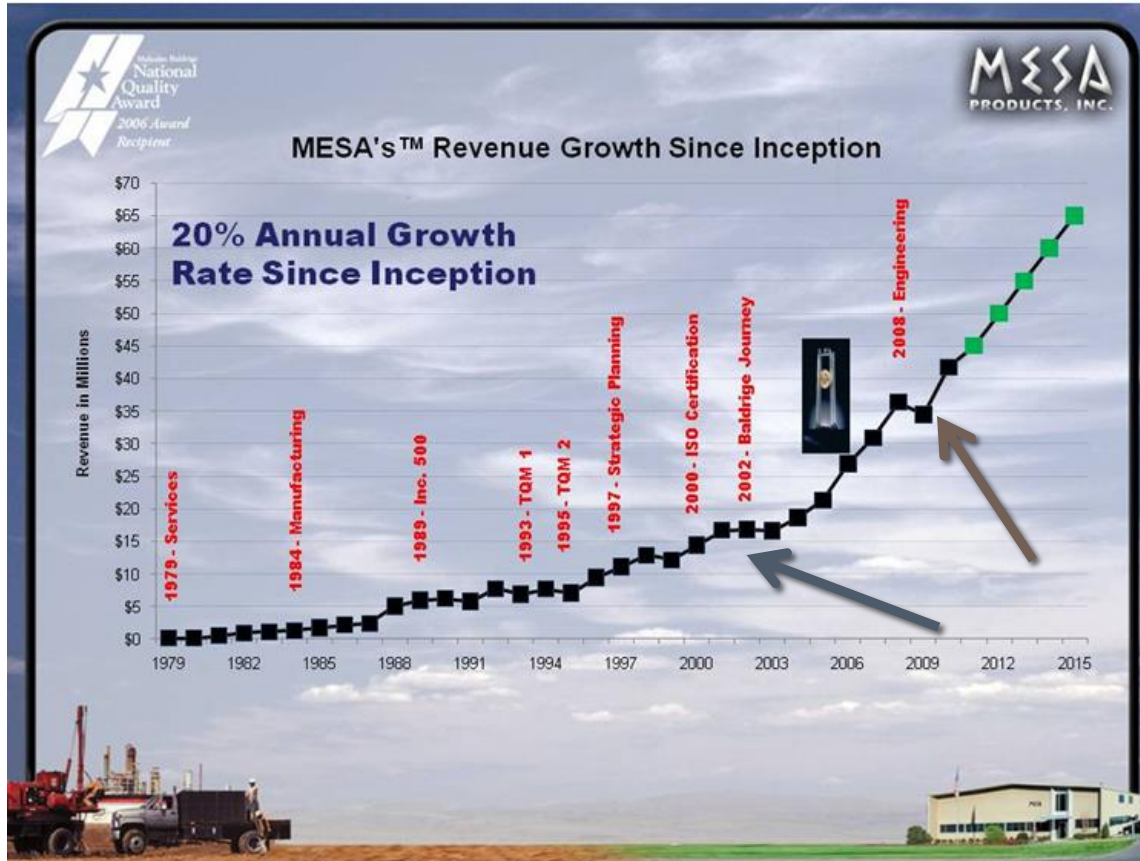


Some Large Companies...



2007 to 2011
Revenues

An 'Excellent' Organization



- MESA – a manufacturer of products that prevent metal structures from corroding
 - Honored as a Presidential role model for the Malcom Baldrige Award in 2006
 - Received Small Business Baldrige award in 2012.

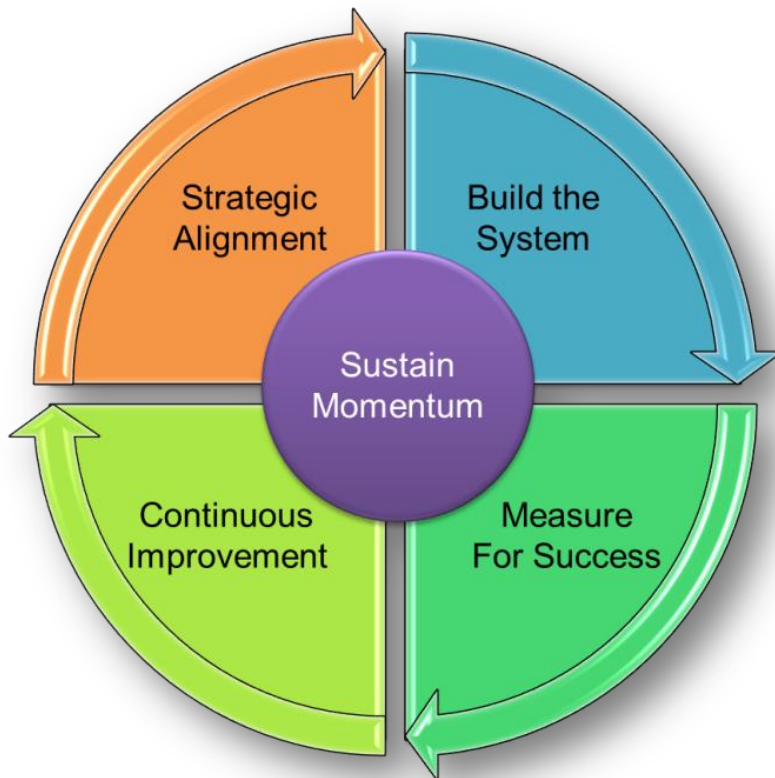
Organizational Excellence

- Baldrige provides a framework for describing a company's System...
 - Mesa has benefited from a systematic approach.
- Large Companies – none are Baldrige recipients.
 - Starbucks and Caterpillar both have a strong commitment to Lean Six Sigma thinking.
- How to build an excellent organization?

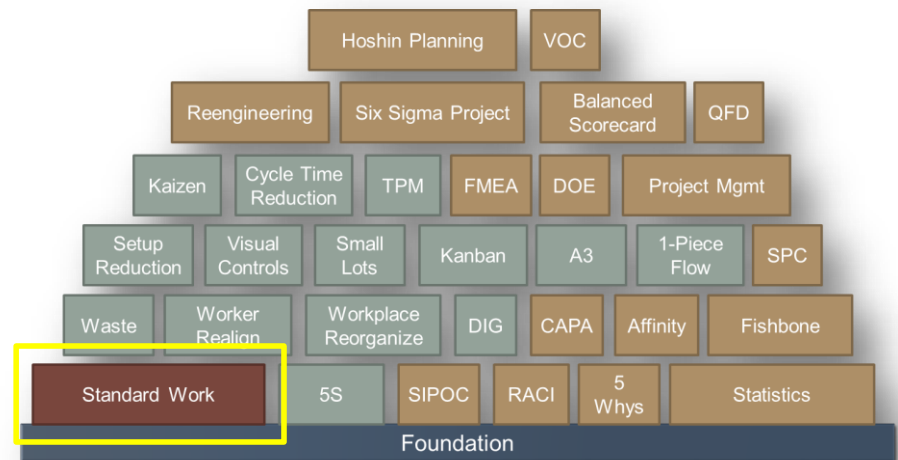


Build an Excellent Organization

Method



Tools



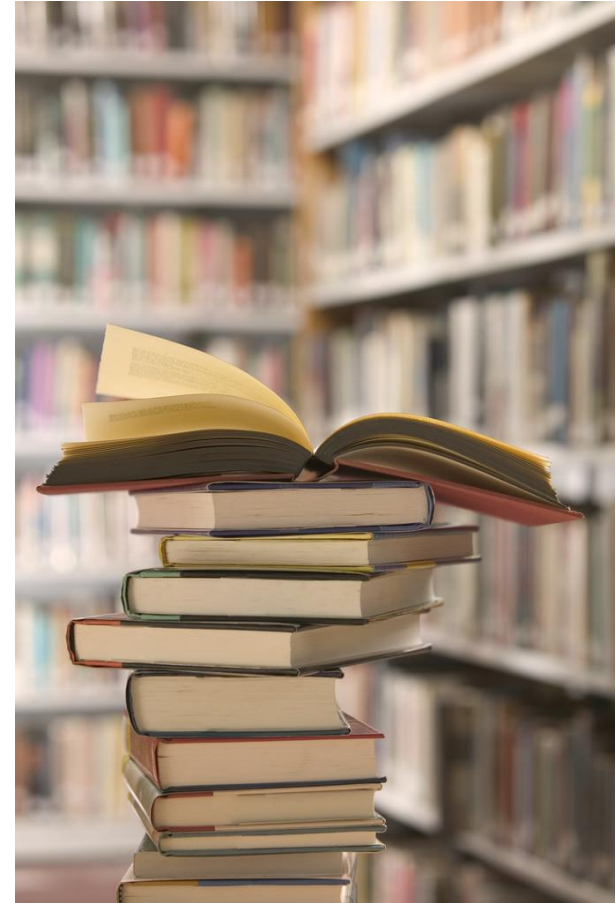
Standard Work

- Definition
 - The sequential actions to complete a job without waste.
 - Takt-Time
 - Work Sequence
 - Standard In-Process Stock
- Benefits
 - Manages change.
 - Better outcomes.
 - Better morale.
- Challenges
 - Standard work must be followed.



Introduction to TWI

- History
- Relationship to Lean & Six Sigma
 - TWI emphasizes the importance of standard work
 - Provides tools and techniques
 - Benefits
 - Improves quality
 - Improves predictability
 - Reduces COQ
- Reference
 - Student Handbook
 - www.TrainingWithinIndustry.Net



Supervisor's Five Needs

- What is a “Supervisor”
- The Five Needs
 1. Knowledge of the Work
 2. Knowledge of Responsibilities
 3. Skill in improving methods
 4. Skill in leading
 5. Skill in instructing



Training Within Industry

- Job Instruction
- Job Relations
- Job Methods


Skill in Instructing...

- Some people are natural teachers – most are not!
- Some people THINK they are good teachers – but many are misinformed!
- Instructing is a skill and must be practiced to be mastered.
- Job Instruction teaches a proven method for teaching effectively...



Why Training is Vital...

- Things change:
 - Design changes
 - New or updated equipment
 - New job requirements
 - New standards
 - People are promoted
 - People leave
- Stuff happens:
 - Improper hires.
 - Ineffective training.
 - Mistakes occur.
 - Careless workers.



Problem Sheet
TWI Program – Job Instruction

Common Problems

That can be overcome or mitigated with more and better training.

Production Problems

- Deliveries delayed because of errors and mistakes.
- Poor job performance because people don't know what to do.
- Logistics mistakes.
- Parts returned for rework or scrap due to quality problems discovered downstream.
- Operators having issues because of upstream changes, such as a process change or a design change.
- Long setup times due to new equipment, new part or new service.
- Tools, materials or inventory clutter – because people were unaware of where it was supposed to go.
- Excessive wear and tear on equipment.

Safety Issues

- Safety equipment not properly used.
- Materials or inventory "in the way".
- Poor shop housekeeping.
- Safety rules are unknown and not followed.
- Job hazards are not clear or not taught.
- Careless behavior.
- Injuries that are not reported.

Quality Problems

- Inspection standards are missed.
- Too much scrap and rework.
- Jigs and gauges not properly used.
- Specifications not followed.
- Work is not clear and left up to the operator causing avoidable mistakes.

Personnel Problems

- People leave because they get frustrated – "can't get the hang of the job".
- New people lack experience and therefore skill.
- No interest in the job.
- Claim to have experience, but don't demonstrate the skill.
- Long setup times and productivity lags due to immature skills.
- Taught incorrectly causing production, quality and safety issues.
- Can't hire fast enough – can't find the skills.
- Get frustrated while being instructed (badly).

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Ineffective Instructing...

- Telling Method

- Challenges:

- Thought speed is greater than listening speed.
 - We are inefficient listeners.
 - Listening skills suffer with age.
 - Listening is hard work.

Top 10 Listening Bad Habits

10. Call subject uninteresting.
9. Criticize the speaker/teacher.
8. Become too stimulated.
7. Listen only for facts.
6. Try to organize the information.
5. Fake attention.
4. Create or tolerate distractions.
3. Evade difficult concepts.
2. Submit to emotion.
1. Waste thought power.

Ineffective Instructing...

- T-Shirt Example
 - Demonstrate ‘Telling’ Instruction method.



“If the worker hasn’t learned, the instructor hasn’t taught.”

Ineffective Instructing...

- Showing Method

- Advantages

- Sets the standard.
- Emphasizes sequence.

- Challenges

- Depends on a skilled instructor.
- Small group focused.
- Repetition for retention.



Ineffective Instructing...

- T-Shirt Example
 - Demonstrate ‘Showing’ Instruction method.



Folding a T-Shirt Instructional Video
By Shoko

“If the worker hasn’t learned, the instructor hasn’t taught.”

Effective Instructing...

- TWI Job Instruction

Prepare to Instruct

1. Have a Time Table
2. Break Down the Job
3. Have Everything Ready
4. Have Workplace Arranged

How to Instruct

1. Prepare the Worker
2. Present the Operation
3. Try Out Performance
4. Follow-Up

HOW TO GET READY TO INSTRUCT

Have a Time Table –

How much skill you expect the worker to have, and by what date.

Break Down the Job –

List important steps.
Pick out the key points. (Safety is always a key point)

Have Everything Ready –

The right equipment, materials, and supplies.

Have Workplace Properly Arranged –

Just as the worker will be expected to keep it.

JOB INSTRUCTION TRAINING



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KEEP THIS CARD HANDY

HOW TO INSTRUCT

Step 1 – Prepare the Worker

Put the worker at ease.
State the job and find out what he/she already knows.
Get worker interested in learning the job.
Place in correct position.

Step 2 – Present the Operation

Tell, show and illustrate one IMPORTANT step at a time.
Stress each KEY POINT.
Instruct clearly, completely, and patiently, but no more than can be mastered.

Step 3 – Try Out Performance

Have worker do the job, correct errors.
Have worker explain each KEY POINT to you as he/she does the job again.
Make sure the worker understands.
CONTINUE until you know, he/she knows.

Step 4 – Follow Up


Put worker on their own. Designate to whom he/she goes for help.
Check frequently. Encourage questions.
Taper off extra coaching and close follow-ups.

*If Worker Hasn't Learned,
The Instructor Hasn't Taught.*

Effective Instructing...

- T-Shirt Example
 - Demonstrate Method.

JOB BREAK-DOWN WORKSHEET
Training Aid

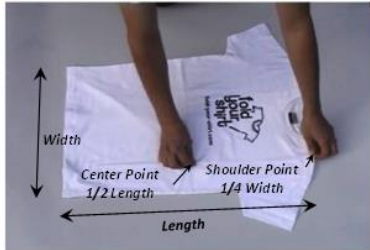


Process: T-Shirt Cleaning
Part or Service: Folding Service
Tools: Flat Table
Supplies: Ironed T-Shirt
Safety Equipment: Latex gloves
Last Updated: 27-Dec-12
Author: Chris Lindstrom

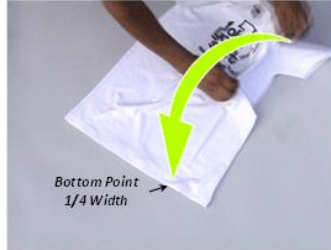
Common Key Points
1) Always wear gloves to keep hand oils off of customer's shirts.

	Major Step	Key Point(s)
	Logical steps that advance the work.	Points in the steps that: - Make or break the job - May injure the worker - Make the work easier
1	Lay shirt onto table facing up, and collar on the left.	Shirt must be face up! Be sure learner knows left from right.
2	Grasp center point with your right hand.	Use index finger and thumb (see training aid, picture A)
3	Grasp shoulder point with your left hand.	Use thumb on top, index finger underneath (see training aid, pic A)
4	Fold over center point, from shoulder point to bottom point, then grasp by placing thumb under the shirt.	See training aid, pic B
5	Pick up shirt, and spread your arms.	
6	Lay shirt onto table facing down and fold over to cover the protruding sleeve.	Be sure shirt is flat with no wrinkles.
7	Release and pick up the shirt by its shoulder points and place on the complete pile.	Be sure shirt collar is facing up and forward in the pile.

TRAINING AIDS



Picture A

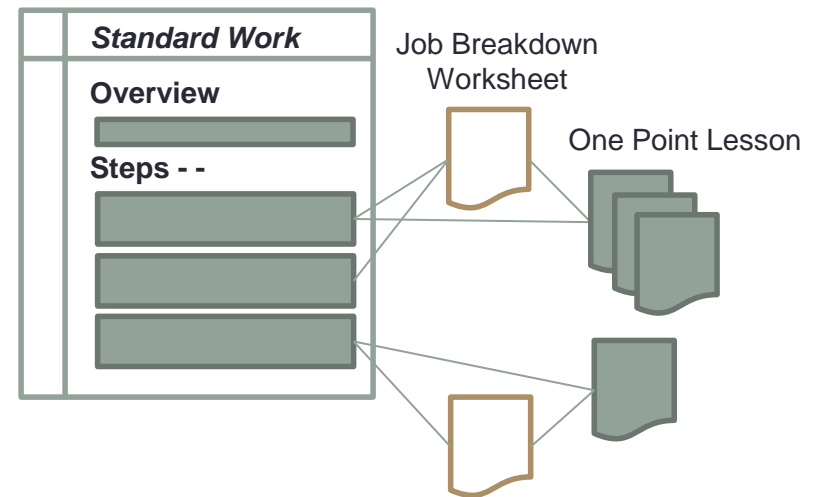


Picture B

“If the worker hasn’t learned, the instructor hasn’t taught.”

Standard Work & TWI

- Standard Work
 - Complete document for a specific process or procedure in a production area – includes:
 - Connection to company strategies
 - Safety Impacts
 - Environmental Impacts
 - Procedural Steps
 - Controlled document
- Job Breakdown Worksheets
 - Instructional aids
 - Used by the Supervisor / Trainer
- One Point Lessons
 - Visual illustration of a step or sub-step.
 - Used by operators as reference.



Job Relations

- Supervisor's Five Needs
 1. Knowledge of the Work
 2. Knowledge of Responsibilities
 3. Skill in improving methods (Job Methods)
 4. Skill in leading (Job Relations)
 5. Skill in instructing (Job Instruction)



Supervisor's Challenges...

- Worker Importance
 - Business value is defined by our customers.
 - People & machines create business value.
 - Machines are assets (TPM)
 - People are assets – but different.
- Supervisor Importance
 - Supervisor and the Worker relationship defines 90% of the worker's experience.
 - Supervisors can only produce results through cooperation with people inside and outside of his/her area of responsibility. .
- **Cooperation is the best and most efficient way of delivering results.**



Foundations for Good Job Relations

There are some things that we as supervisors can do, everyday, to keep *job relations in good condition*.



1. Let each worker know how he/she is getting along

2. Give credit when credit is due

3. Tell people in advance about changes that will affect them

4. Make best use of each person's ability

These foundations are important to everyone. Using them will smooth job relations and head off problems before they occur!

When something happens...

Get the Facts

Review the Record.

Weigh and Decide

Don't Jump to Conclusions!

Take Action

Don't Pass the Buck!

Check Results

Improve Production!

- Then what should we do with these facts?
- After deciding, what should we do next?
- After taking action, what should we do next?

Learn

Improve our Foundations

Effective Leading...

- TWI Job Relations
- Foundations for Good Relations
 1. Let each worker know how they're doing
 2. Give credit when due
 3. Advance notice
 4. Best use of abilities
- Handle a Problem
 1. Get the Facts
 2. Weigh & Decide
 3. Take Action
 4. Check Results
 5. Learn

JOB RELATIONS

A SUPERVISOR GETS RESULTS THROUGH PEOPLE

Foundations for Good Relations

Let each worker know how he/she is getting along.

Figure out and tell him/her what you expect.
Point out ways to improve.

Give credit when due.

Recognize extra or unusual performance.
Tell him/her while it's fresh.

Tell an employee in advance about changes that will affect him/her.

Tell the worker WHY if possible.
Get him/her to accept the change.

Make best use of each person's abilities.

Look for ability not now being used.
Never stand in an employee's way.

People Must Be Treated As Individuals

JOB RELATIONS TRAINING



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HOW TO HANDLE A PROBLEM DETERMINE OBJECTIVES

Step 1 – Get the Facts

Review the record.

What policies, rules, regulations apply?
Talk with individuals concerned and get opinions and feelings.

Step 2 – Weigh and Decide

– Don't Jump to Conclusions –
Fit the facts together and consider their bearing on each other.

What possible actions are there?
Check each action against objectives, weighing effect on individual, group, and production.

Select the best actions.

Step 3 – Take Action

– Don't Pass the Buck –

Should I handle this myself?
Who can help in handling?
Should I refer this to my supervisor?
Consider proper time and place.
Explain and get acceptance.

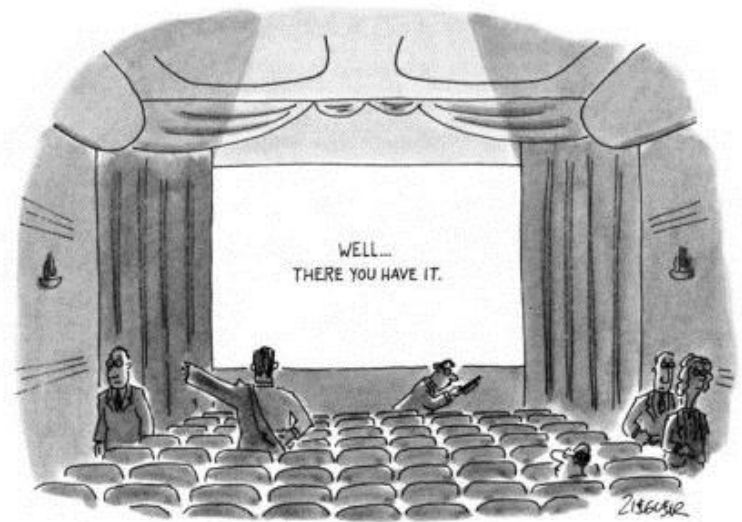
Step 4 – Check Results

– Did my action help production –
How soon and how often will I check?
Watch for changes in output, attitudes, and relationships.

OBJECTIVES ACCOMPLISHED?

Conclusion

- Supervisor's Five Needs
 1. Knowledge of the Work
 2. Knowledge of Responsibilities
 3. Skill in improving methods (Job Methods)
 4. Skill in leading (Job Relations)
 5. Skill in instructing (Job Instruction)



MAKING STANDARD WORK STICK

Lean Six Sigma and Training Within Industry



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LSS & TWI

The End

