

Training Within Industry (TWI)

NDWFHR Conference

September 22, 2016

Supervisor Skills Training

“The Missing Link to Lean and Kaizen”

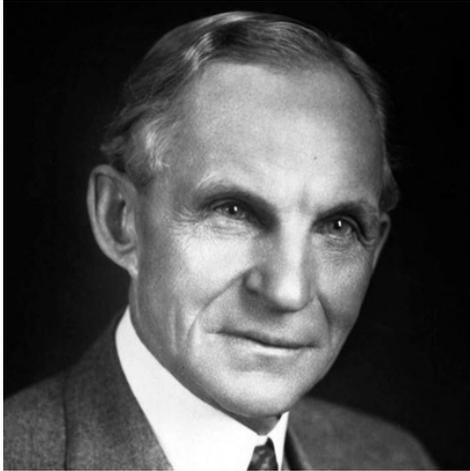
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IMPACT DAKOTA
People • Purpose • Process • Performance

Henry Ford's Lean Vision



“The longer an article is in the process of manufacture and the more it is moved about, the greater is its ultimate cost.”

Henry Ford, 1926

Ford Motors earned unprecedented profits in 1926 as the result of *eliminating waste* to gradually reduce the production cycle to 81 hours from iron ore to finished product.

Toyota Production System

Time Line



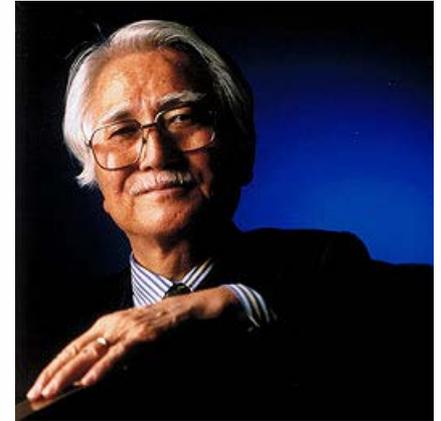
(reduce by removing non-value-added wastes)

Taiichi Ohno 1978

KAIZEN

Kaizen is a strategy to involve everyone – managers and workers alike - to maintain and continuously strive to improve working standard through small, gradual improvements.

“*Muda* (non-value adding waste) elimination epitomizes the low-cost, commonsense approach to improvement.”



Masaaki Imai 1986

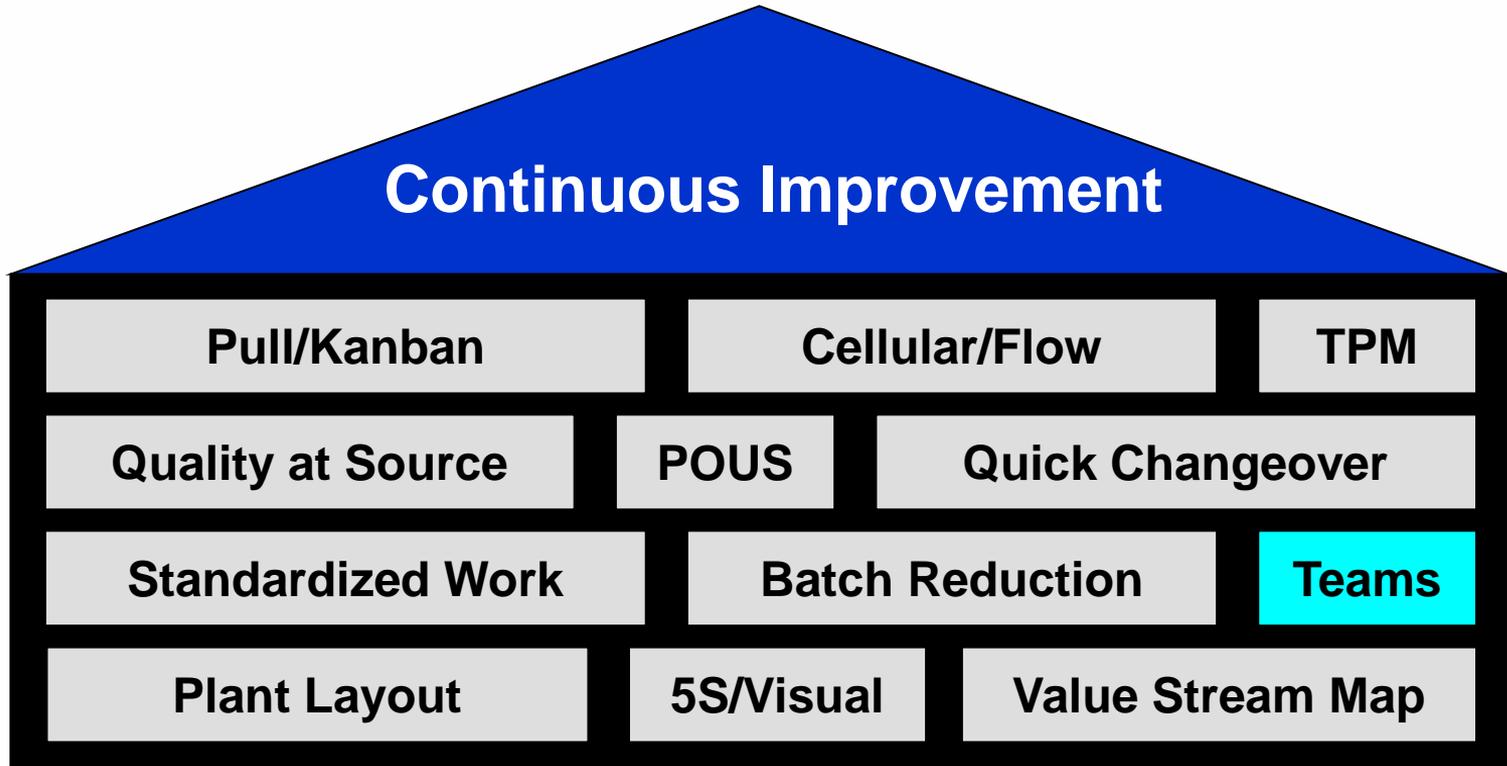
Lean Thinking

Eliminate Non-Value-Adding Waste



James Womack & Daniel Jones 1996

The Lean Building Blocks



The Problem with Lean

Some realities of implementing Lean:

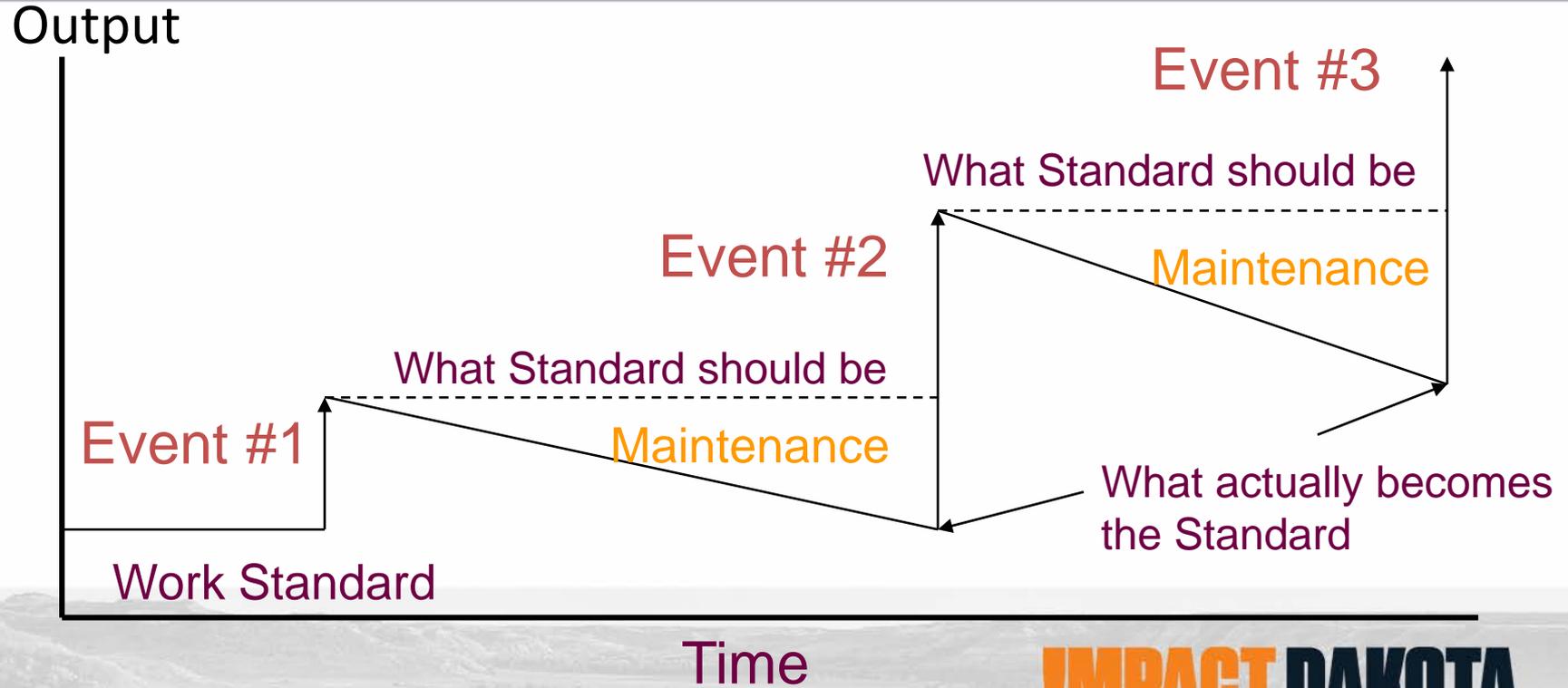
- ! A crisis may be the best way to get people to understand the need for change, but it's a lousy way to run daily operations.
- ! Implementing Lean reveals problems and internalizing policies for corrective action does not ensure that everyone continuously works on these problems.
- ! Lean Manufacturing relies on the involvement of everyone and kaizen events alone will simply take too long to involve everyone.
- ! Implementing Lean changes is the easy part – *sustaining those changes is what's hard.*

The Problem with *Kaizen*

The biggest problem with continuous improvement is that *it never seems to be continuous.*

- People resist change and this mindset will cause people to backslide and abandon improvement.
- Even when people want to improve they don't have improvement skills.
- Supervisors and managers often leave improvement until after “making the numbers.”
- People rely on “experts” to devise all the improvements.
- It seems like we need to conduct big deal kaizen events for even small changes.

KAIZEN Event (Blitz)



Training Within Industry Program

Job Instruction – trains supervisors how to *quickly* train employees to do a job correctly, safely, and conscientiously.

Job Methods – teaches supervisors how to *continuously improve* the way jobs are done.

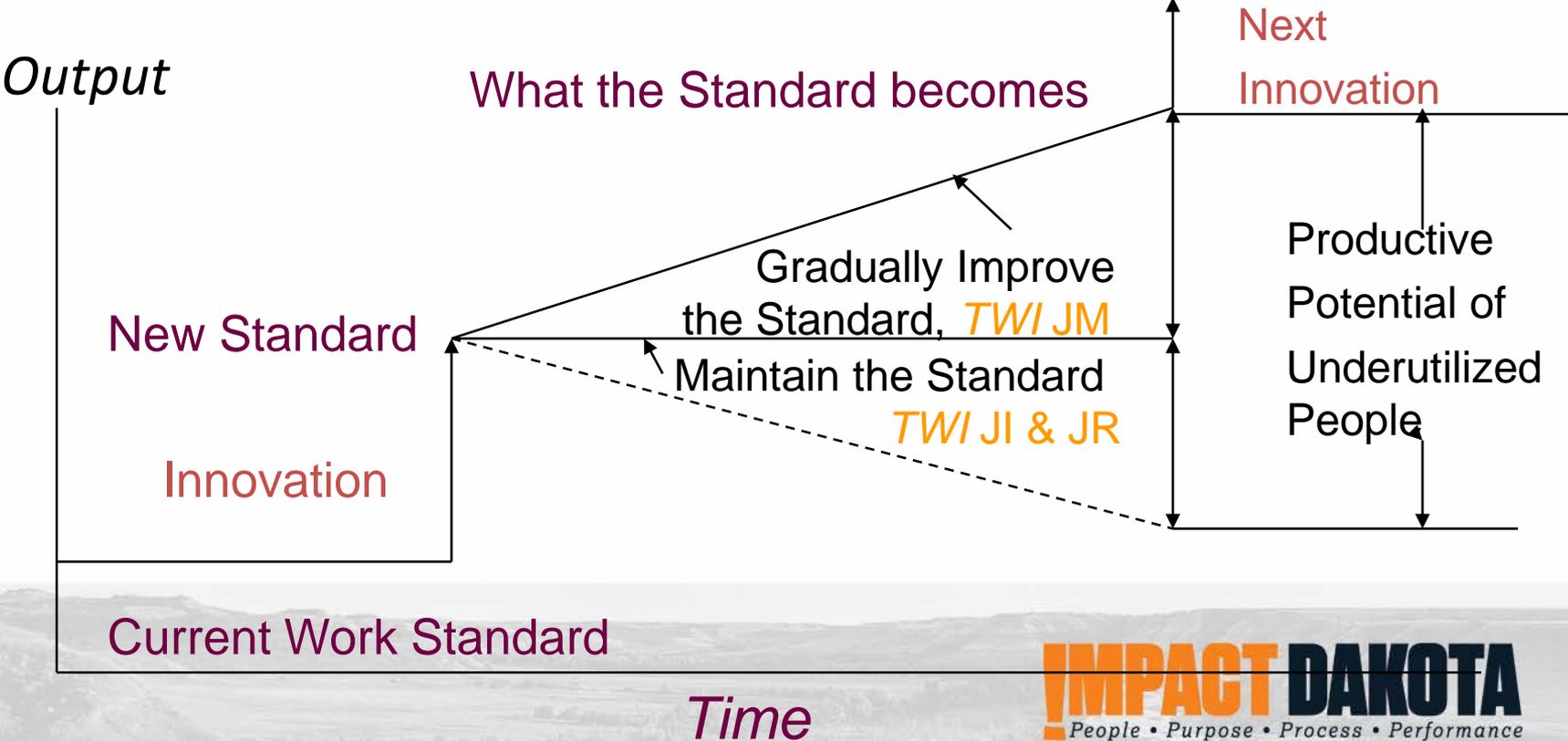
Job Relations – trains supervisors how to develop and maintain positive employee relations to *prevent problems* from happening, and how to effectively *resolve conflicts* that arise.

TWI - The Countermeasure

TWI provides a countermeasure for problems by

- Indoctrinating people into an “improvement” frame of mind.
- Teaching people how to identify opportunities for improving their jobs.
- Training people how to generate ideas to take advantage of these opportunities.
- Showing people how to get these ideas into practice right away.
- Creating ownership of standard work.
- Providing a systematic approach to improving continuously.

The Missing Link to *Lean & Kaizen*



TWI - Created to fill a need

TWI was developed by a U.S. Government Service after the fall of France on June 22, 1940 that signaled a US involvement in the war in Europe.

The purpose for TWI was

“to help industry to help itself to get out more materials than have ever been thought possible, and at constantly accelerating speed” to win the war.

Impact of TWI on the War Effort

Actual data reported by over 600 client companies monitored throughout WWII attributed the following results to TWI:



86%	increased production by at least 25%
100%	reduced training time by 25% or more
88%	reduced labor-hours by over 25%
55%	reduced scrap by at least 25%
100%	reduced grievances by more than 25%

TWI - After the War

- ! The TWI program was discontinued as US companies rushed to fill a world wide demand for consumer goods with an influx of returning veterans into the workforce who were not trained in TWI.
- ! Like Dr. Deming, TWI traveled to help Japan rebuild their industrial base and, as we now know, for Japan “to get out more materials than have ever been thought possible, and at constantly accelerating speed.”

Impact of TWI at Toyota

PAST

1951 to 1960 – Toyota Japan trained their employees in the Toyota Production System and continues to this day.

PRESENT

2001 - Toyota KY received over 100,000 improvement suggestions from employees, 98% of which were used resulting in a savings of \$18,000,000, and returned \$3,000,000 for individual awards of \$25 to \$25,000.

FUTURE

2003 - Toyota North America announced plans underway to deliver custom orders of vehicles in 2 or 3 weeks like they are now doing in Japan and will use TWI to train their second and third tier suppliers to reach that goal.

TWI - A Timeless Training Approach

1. The program is one of *utter simplicity*
2. It uses a *blueprinted procedure* that requires a minimum of time
3. Adheres to the *learn by doing* principle
4. Built in *multipliers* to spread the training

1. Utter Simplicity

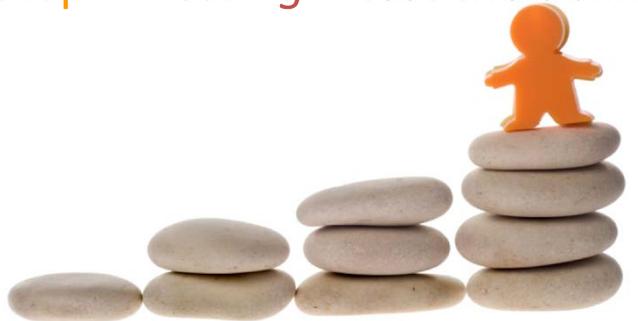
The Four-Step Learning Process*

Step 1. *Preparation* – make the learner think to aid comprehension of the new idea.

Step 2. *Presentation* – add the new idea to those already in the learner’s mind.

Step 3. *Application* – train the learner to apply what was presented and check results.

Step 4. *Testing* – test the ability of the learner to apply the new idea alone.



* Developed by Charles R. Allen in WWI

2. Blueprinted Procedure

A common thread runs through all TWI programs as the result of much trial and error learning during introduction:

- Each program has a similar 4-Step Method.
- The method is stated in shop terms, not in academic language.
- Each participant must use the method to solve a current problem in class to get immediate use and acceptance.

Blueprinted Procedure

- ! Small groups of 10 to practice the method under guided assistance to “learn by doing”.
- ! An outline of *what* and *how* and *time* sets a universal standard.
- ! Ten hours of class are best delivered in five 2-hour meetings without a break.
- ! Compact scheduling of the 5 meetings to keep the subject fresh and not keep people away from their jobs over long periods of time.

3. “Learn by doing”

The TWI approach is not a matter of schools or classes or lessons –
it is individual and/or group work on *current day problems* of output, quality, lost-time, scrap, re-work, maintenance, and working relations.



4. Multipliers Spread the Training

The TWI Program utilizes a standard method to

- ! Train people from industry to become TWI Trainers
- ! TWI Trainers train the people who direct the work of others (supervisors, team leaders, managers, etc.)
- ! Supervisors spread the training to other people in the workplace by involving them as required in the process.

The Five Basic Needs of Supervisors

Knowledge

unique to the Company and/or the Industry that supervisors must know to do their job:

1. Knowledge of the Work
2. Knowledge of Responsibilities

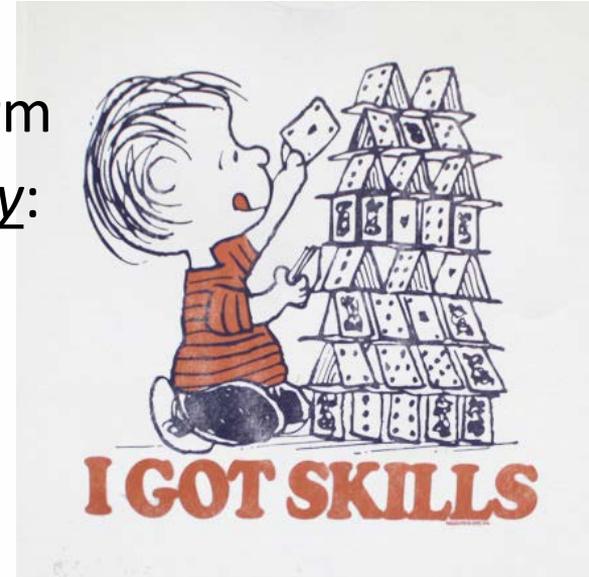


The Five Basic Needs of Supervisors

Skills

that are required for supervisors to perform within their role, regardless of the industry:

3. Instruction
4. Methods Improvement
5. Leading



Job Instruction - Objective



Develop a well-trained workforce resulting in
less scrap and rework,
fewer accidents, and
less tool and equipment damage.

Results from JI Training

- ! Reduced training time
- ! Increased production
- ! Fewer accidents
- ! Less scrap
- ! Less rework
- ! Less tool and equipment damage
- ! Increased job satisfaction
- ! Improved quality
- ! Increased profits



JI = Standardized Work = \$

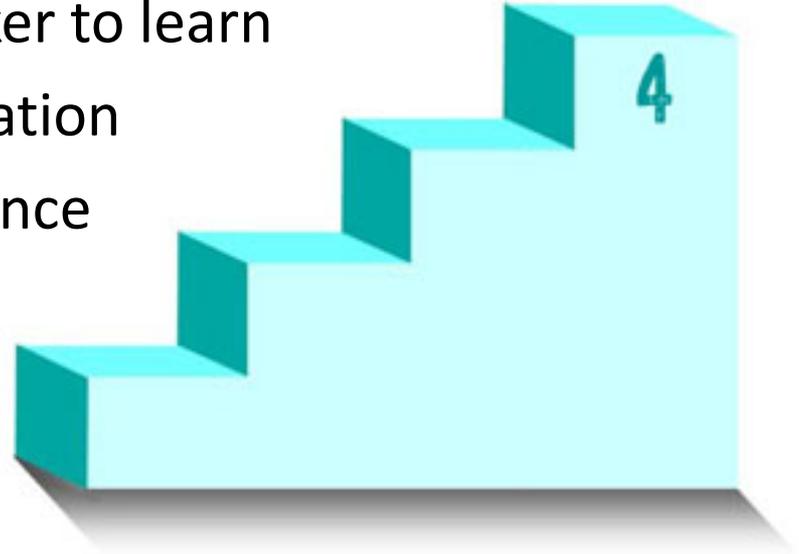
“In our wax area, where “JI” has been used for about 10 months, we have already reduced the need for rework and repair of wax related defects by over 60%.”

Operations Manager, Gray-Syracuse, Inc., April 2003

“All wax department instructions were completed in the “JI” format and all operators were retrained to further reduce the need for rework and repair of wax related defects by an additional 95% since April.” Wax Department Supervisor, Sept. 2003

The 4-Step Method for JI

1. Prepare the worker to learn
2. Present the operation
3. Try-out performance
4. Follow-up



No. _____

Present the Operation

JOB INSTRUCTION BREAKDOWN SHEET

Operation: _____

Parts: _____

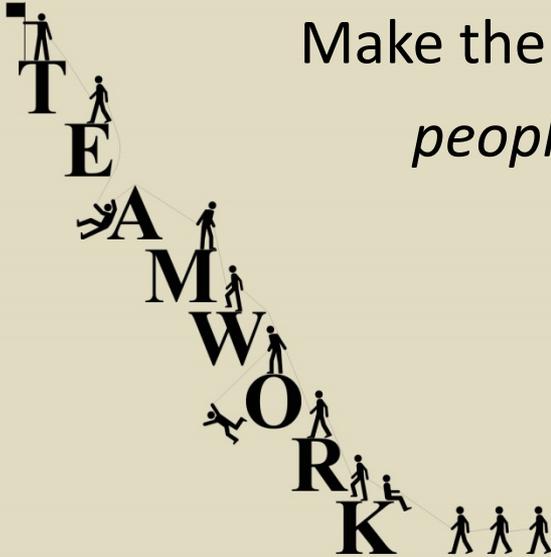
Tools & Materials: _____

IMPORTANT STEPS	KEY POINTS	REASONS
A logical segment of the operation when something happens to advance the work.	Anything in a step that might— 1. Make or break the job 2. Injure the worker 3. Make the work easier to do, i.e. “knack”, “trick”, special timing, bit of special information	Reasons for each key point

JOB INSTRUCTION TRAINING TIMETABLE

Name: _____ Dept.: _____ Date: _____	Break-down No.													Changes In Production
Turnover Work Performance														

Job Methods - Objective



Make the best use of the
people, machines, and materials
now available.

Concrete Results from JM Training

Improvement is not a matter of impression, results are obtainable and apparent

- ! Reduced cost
- ! Reduced WIP
- ! Reduced inventory
- ! Increased throughput
- ! Increased sales
- ! Increased profits
- ! Continuous improvement



TEAM

T TOGETHER

E EVERYONE

A ACHIEVES

M MORE

JM = Immediate & Continuing ROI

ROI at Schneider Packaging Equipment Co. as the result of Job Methods Training, December 2002

Investment: Training: \$5,000

Employee time (est. 120 hrs.): 6,000

Total Cost (est. \$11,000

Savings realized within 30 days \$34,300

Immediate Return on Investment 312%

Projected Annualized Savings \$124,690

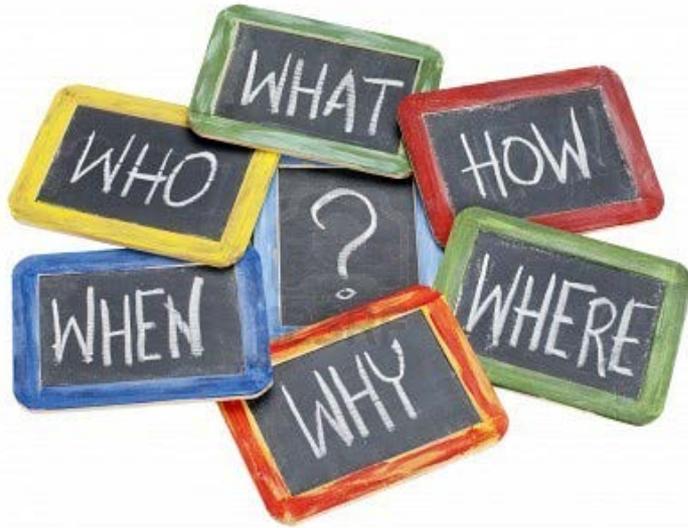
Potential Return on Investment 1134%

The 4-Step Method for JM

1. Breakdown the Job
2. Question Every Detail
3. Develop the New Method
4. Apply the New Method



Step 2 - Question Every Detail



Why is it necessary?

What is its purpose?

Where should it be done?

When should it be done?

Who is best qualified to do it?

How is “the best way” to do it?

Step 3 - Develop the New Method

Why?
What?



Eliminate

Where?
When?
Who?



Combine
Rearrange

How?



Simplify

JM Improvement Proposal

Improvement Proposal Sheet

Submitted to:
Made by:
Product/Part:
Operations:

Department:
Date:

The following are proposed improvements on the above operations.

1. Summary

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2. Results

	Before Improvement	After Improvement
Production (one worker per day)		
Machine Use (one machine per day)		
Reject Rate		
Number of Operators		
Other		

3. Content

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Step 4 - Apply the New Method

1. Sell the change to others
2. Obtain necessary approvals
3. Put the new method to use right away
4. Credit those involved
5. *Continue to improve the new method*



Job Relations - Objective

Build positive employee relations by effectively resolving conflicts that arise.

Maintain positive employee relations by preventing problems from happening.



Results from JR Training



- ! Better employee relations
- ! Improved morale
- ! Fewer grievances
- ! Improved attendance
- ! Less equipment damage
- ! Improved quality
- ! Increased production
- ! Reduced cost

JR Results - Early on

Problem:

“Because of poor morale, our labor turnover was terrific; complaints and grievances were multitudinous; production schedules lagged.”

Solution:

The Production Manager and Director of Training became JR trainers. “They came back and presented the program to all our supervisors. Within a fortnight (*2 weeks*), complaints and grievances ceased; labor turnover stopped, and production went ahead of schedule.”

H. L . Austin, VP Food Machinery Corp. Sept. 1945

JR Results - Today

“This would have been a perfect course when I started as a leader, 20 years ago! It is simple and based on a foundation of values. This will help build trust and understanding in the workforce.”

Team Leader, Gray-Syracuse, Inc., July 2002

How to Handle a Problem

DEFINE YOUR OBJECTIVE

Step 1 - Get The Facts

Get the whole story

Step 2 - Weigh And Decide

Don't jump to conclusions

Step 3 - Take Action

Don't pass the buck

Step 4 - Check Results

Did your action help production?



DID YOU ACCOMPLISH YOUR OBJECTIVE?

How to Prevent Problems

- ! Let each worker know how he/she is doing
- ! Give credit when credit is due
- ! Tell people in advance about changes that will affect them
- ! Make the best use of each person's ability

The Measurements of Best in Class

- ! **QUALITY**
 - Providing exactly what the customer wants the first time,
- ! **COST**
 - at a price that represents value to the Customer,
- ! **DELIVERY**
 - in a manner that is timely for the Customer,
- ! **SAFETY**
 - with concern for the well-being of all,
- ! **MORALE**
 - through the spirit of Improvement.

Strategies don't produce, *People Do!*

TWI - *the Missing Link*

Proactive Leadership

Job Methods - maximize the use of people, machines and materials

JIT

TPM

Pull / Kanban

Cellular/Flow

Batch Reduction

Quick Changeover

PM

POUS

Job Instruction - standardize work to sustain the gain

Quality at Source

Standardize Work

Visual
Controls

5S

Plant Layout

Teams

Value Stream
Mapping

Job Relations - utilize the productive potential of people

CULTURE CHANGE

The Growing TWI User List

Beech-Nut Nutrition	NY	Baby Cereal Products
Bobcat	ND	Manufacture Construction Equipment
CABLExpress	NY	Refurbish Electronics Equipment
CITEC	NY	Watertown MEP
DeIORIO'S Bakers	NY	Frozen Dough Products
Dielectric Laboratories Inc.	NY	Ceramic Capacitors, Substrates, Thin Film Products
DMI	ND	Manufacture Wind Towers
East Coast Olive Oil	NY	Food Processor
Fargo Assembly	ND	Assembler
G.A. Braun	NY	Commercial Laundry Equipment
Granny's Kitchen	NY	Bakery Products
Herkimer County Cheese	NY	Food Processing
Higbee	NY	Manufacture Gaskets
High Tech Rochester	NY	Rochester MEP
Konica Manufacturers Supplies	U.S.A.	MD Manufacturer of Printer Supplies
MACNY	NY	Manufacturers Association of Central New York
MA MEP	MA	Massachusetts MEP
Minnkota	ND	Manufacture Windows
MVATC	NY	Utica MEP
New York Air Brake	NY	Manufacture Components for Railroads
ND MEP	ND	Bismarck and Fargo Offices
Oberdorfer Pumps	NY	Industrial, Marine and Agricultural Pumps
Phoenix	ND	Wire Assemblies
R B Woodcraft Company	NY	Wood Cabinets and Displays
Rugby Manufacturing	ND	Truck Bed Manufacturer
Schneider Packaging Equip.	NY	Manufacturer Packaging Equipment
Syracuse Castings	NY	Metals Fabricator
Tecton Products	ND	Manufacture Windows
Yankee Candle Company	MA	Manufacturer and Distributor of Candles