Introduction to Lean Management

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Agenda

- What is Lean Six Sigma?
  - Fundamentals
  - Methodology
- 8 Wastes
- Takt Time
- Typical Results
- Lessons Learned
WHAT IS LEAN SIX SIGMA?

History of Manufacturing

Craft Production
- Highly customized products made by skilled craftsmen
- Low volume, high cost production

Mass Production
- Interchangeable parts were introduced
- Assembly line production
- High volume, low cost production of standard items

Lean Production
- Focus on eliminating waste and improving quality
- High production combined with flexible scheduling
- Low cost, high quality, high variety products

What is Lean Six Sigma?

"In short, lean thinking is lean because it provides a way to do more and more with less and less —
less human effort, less equipment, less time, and less space
— while coming closer and closer to providing customers with exactly what they want."

James P. Womack & Daniel T. Jones
Lean Thinking: Banish Waste and Create Wealth in Your Corporation
What is Lean Six Sigma?

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Lean Manufacturing

What is Lean Six Sigma?

Lean Manufacturing

Started by Toyota in late 1940s
Toyota Production System (TPS)
Renamed "Lean" in the 1990s
Reduce waste & increase speed
What is Lean Six Sigma?

**Lean Manufacturing**

“Preserve Value with Less Work”

“Do More With Less”

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![Automobile production history graph](image)

- United States
- Japan

(from 1961 to 2008) (in millions per year)

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What is Lean Six Sigma?

- Efficiency
- No Waiting Times
- No Wastes

- Six Sigma
- Lean Six Sigma
Six Sigma
Developed by Motorola in 1986
Popularized by Jack Welch at General Electric (1995)
Improve quality, minimize variability, remove defects
Reduce rework
6 Sigma means fewer than 3.4 defects per million or 99.99966% defect-free products

What is Lean Six Sigma?
Lean Manufacturing
Six Sigma
Lean Six Sigma

What is Lean Six Sigma?

What is Lean Six Sigma?
What is Lean Six Sigma?

Lean Six Sigma – Benefits

- Increased speed
- Reduced costs
- Improved quality
- Increased customer satisfaction

Customer Satisfaction
Profability
Increased Revenue

Efficiency
No Waiting Times
No Wastes

Effectiveness
Low Variation
Good Quality

Lean Six Sigma

Efficiency
No Waiting Times
No Wastes

Effectiveness
Low Variation
Good Quality

Lean Six Sigma
Lean is a journey, not a destination

A QUICK WARM-UP EXERCISE . . .

A quick warm-up exercise . . .
FUNDAMENTALS OF LEAN SIX SIGMA

Fundamentals of Lean Six Sigma

VALUE
Defined by the customer

PERFECTION
Constantly seek perfection

MAP
Maps processes to aid understanding

PULL
Customers pull value, plant pulls product

FLOW
Processes must have proper flow

Value
Value is defined by the customer - period!

- Value Added (VA)
  Customer wants it
  AND it changes form, fit or function
  AND it is not rework.

- Non-Value Added (NVA)
  Does not change form, fit or function
  OR defined as waste
  OR it is rework.
Fundamentals of Lean Six Sigma

Map

Value Stream Map (VSM) displays all the specific actions required to produce a product or service.

- 3 Type of VSMs:
  - Current State
  - Ideal State
  - Future State

- VSM always uncovers enormous amounts of waste in a process.

Current State VSM

Current State VSM
Current State VSM

Ideal State VSM

Future State VSM

More on this in the next session...
Push and Flow

- Kanban
  - Kan (card) Ban (signal)
  - Visual cuing system to indicate items (material, parts, information) are ready or authorized to move downstream.
  - Just in Time

Fundamentals of Lean Six Sigma

Push and Flow

- Kanban

Fundamentals of Lean Six Sigma

Push and Flow

- Kanban

Fundamentals of Lean Six Sigma

Push and Flow

- Kanban
Fundamentals of Lean Six Sigma

Perfection
- Continuously seek perfection because every process can be improved.
- Remove waste.
- Reduce NVA.
- Perfection is a journey, not a destination.

What does your value stream look like?

What does your value stream look like?
LEAN SIX SIGMA METHODOLOGY

Define
- Define the current process & project goals

Measure
- Measure key aspects of the current process; collect relevant data

Analyze
- Analyze data, determine root causes, find improvement opportunities

Improve
- Improve the process based upon data analysis

Control
- Control the improvements to ensure sustainable results
Lean Six Sigma Methodology

Faster is better and better is faster
- Speed & quality are inextricably linked.
- Don’t work faster, eliminate the things that slow you down.

All-out war on waste
- Waste is root cause of all process problems.
- Identify & eliminate.

THE EIGHT WASTES

Does anyone speak Japanese?

無駄
Does anyone speak Japanese?

“Muda”
無駄
Waste

Lean Six Sigma – War on Waste!

The Eight Wastes

- Transportation
- Inventory
- Motion
- Waste
- Overproduction
- Overprocessing
- Defects
- Undervalued Human Resources
The Eight Wastes: Tim Wood U.

- Transportation
- Inventory
- Motion
- Waiting
- Overproduction
- Overprocessing
- Defects
- Underutilized Human Resources

TAKT TIME
And now for some German

Takt Time

- **Takt** “stroke”
- **Zeit** “time”
- **Taktzeit** “cycle time”

- Production paced to meet customer demand
- Balanced flow
Takt Time

\[ Takt = \frac{\text{Available Time}}{\text{Demand}} \]

Question:

What is your Takt time from soil receiving to clean?

Results/Savings

Documented results and key metrics in general industry and textile rental operations
Typical Results

- Increase process speed by 25 - 50%
- Reduce operating costs by 10 - 25%
- Reduce inventory costs by 25 - 50%
- Reduce WIP by 70 - 90%
- Reduce space by 10 - 25%

Documented Results

Defense Industry

LOCKHEED MARTIN

$4 billion in documented savings in 4 years

Documented Results

Finance

BANK ONE

Complaint resolution dropped from 30 to 8 days
Documented Results

Healthcare

STANFORD HOSPITAL & CLINICS

ICU care per patient went from 29.6 to 19 hours

LESSONS LEARNED

Documented Results

Government

Pot hole repair time reduced from 80 to 24 hours
Lessons Learned

- LSS is continuous.
- LSS can be counterintuitive.
- Production must be on board.
- Lack of maintenance is a killer.
- Don’t forget to measure & control.

House of Lean

Additional Reading
Time for questions

Please wait for the microphone.

THANK YOU!

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Next Sessions

Room 309  See the Buying Signals and Close More Sales Today!  Alan Berg, CSP
Room 302  To Drone or Not To Drone  Matt Sloane with Industry Panel
Room 305  Let's Talk Employees ... Finding, Retaining, Appreciating  Industry Panel
Room 308  Uncover Inefficiencies With Value Stream Mapping  Chip Malboeuf