

# DEVELOPING A LEAN IMPLEMENTATION ROADMAP

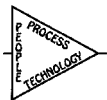
**SME Conference**

**Building Confidence in Lean Manufacturing**

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**Manufacturing Engineering, Inc.**

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# Lean Manufacturing

## Where Do We Start?

- **Employee Empowerment**
- **Continuous Improvement**
- **Manufacturing Technology**
- **JIT**
- **TQM**
- **Cells**
- **Kaizen**

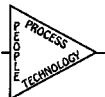
# Where Do We Start?

## The Lean Implementation Roadmap

Present



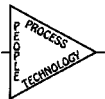
Future



# Why A Roadmap?

## Risk Mitigation

- **Human resources**
- **Capital**
- **Time**



# Key Elements of Lean Manufacturing

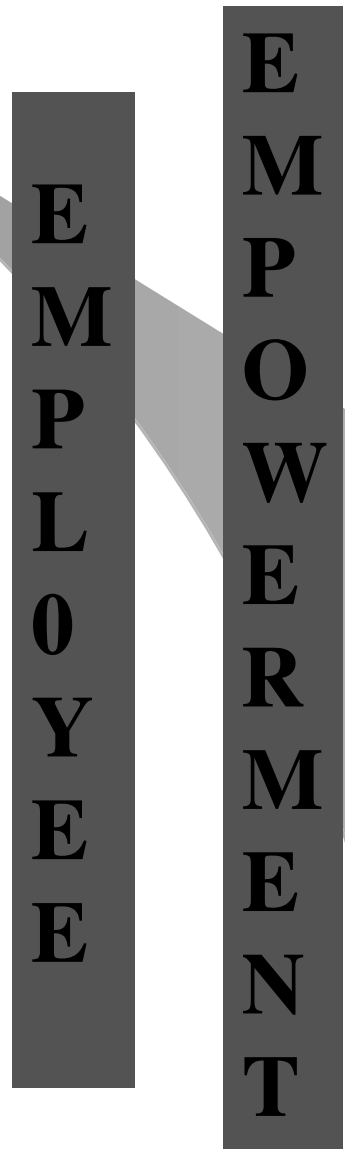
- **System Structure**
- **Control Mechanisms**
- **The Elimination of Waste**

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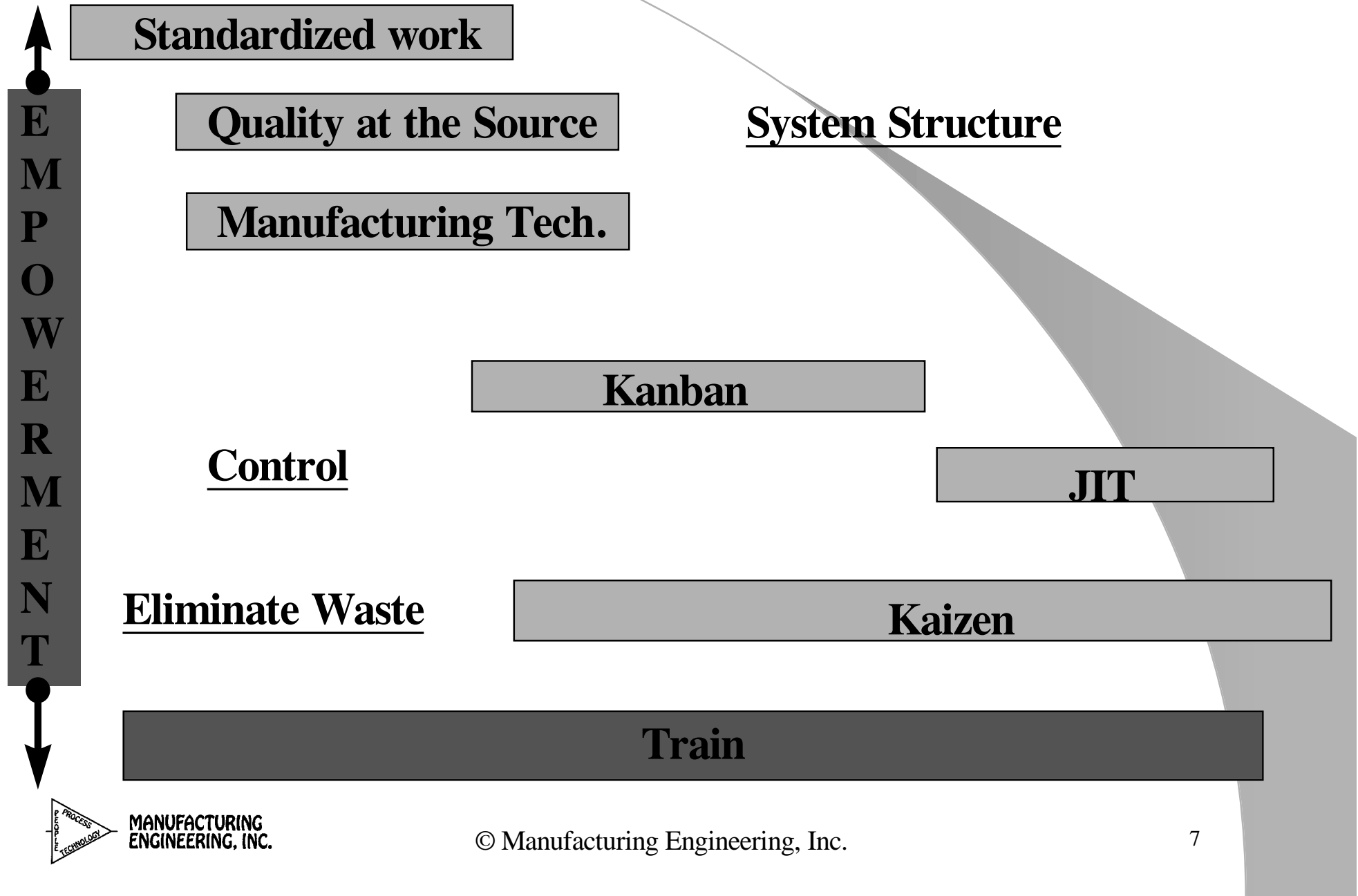
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# Lean Manufacturing Systems

- **System Structure**
  - **Standardized Work**
  - **Quality at the source**
  - **Manufacturing Technology**
- **Control Mechanisms**
  - **Kanban**
  - **Just-In-Time**
- **The Elimination of Waste**
  - **Kaizen improvement teams**



# The Lean Implementation Roadmap



# Define Plan For Each Element

- **Current status and needs**
- **What will be implemented?**
- **Timing**
- **Cost**
- **Validation**
- **Training**

## Standardized work

### - Traditional Manufacturing -

- **Functional layout**
- **The product is routed, staged, and processed**
- **Batch processing**
- **May have a central store room - picks!!**
- **Typically build to stock**

## Standardized work

# Characteristics of Traditional Mfg.

- **High inventory (raw, WIP, and finished)**
- **Lots of indirect labor**
- **Too many and too few parts**
- **Higher cost**

**Standardized work**

# Cellular Manufacturing Process

- **Layout is based on product flow**
- **Resources dedicated to the cell**
- **Takt time**
- **Small lot production**
- **Typically build to order**

## Standardized work

# Characteristics of Cells

- **Highly flexible**
- **Team environment**
- **Rapid problem resolution**
- **Low inventory**
- **Lower cost**

# Simulation

- **Powerful tool for predicting performance**
- **Throughput, cycle time, shipments, and cost**
- **Identify bottlenecks**
- **Strong advantage in dealing with variability**
- **No special programming**
- **Animation allows confirmation**

**- VALIDATION -  
- RISK REDUCTION -  
TRAINING**

# For Additional Information

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