

# **LEAN Alternatives**

**Lean doesn't have to be expensive and disruptive**

Mid-Hudson APICS - November 10, 2004

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# Agenda

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- What is this about?
- What is Lean Manufacturing?
- Lean on the plant floor
- Lean Alternatives

# What is this About?

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- Most often used in repetitive environments
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- Lean Manufacturing is well established in the automotive industry
- Most often used in repetitive environments
- Most often includes flow manufacturing and kanbans
- **The transition to flow is often expensive and disruptive**

# What is Lean Manufacturing?

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- The elimination of waste in every area of production, including customer relations, product design, supplier networks and factory management.
  - The MIT Production System Design Laboratory

# What is waste?

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- Overproduction
- Inventory or WIP
- Transportation
- Processing Waste
- Motion
- Waiting
- Defects

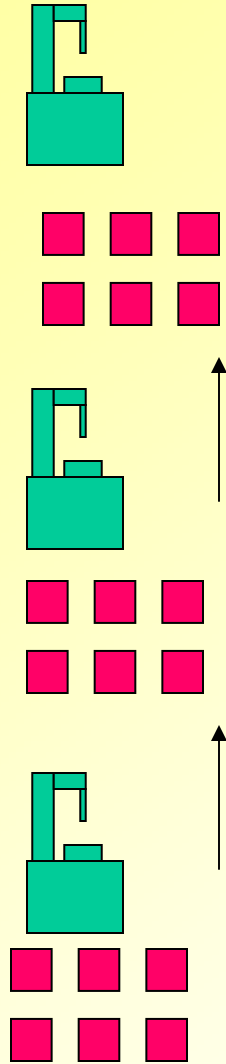
# Lean on the Plant Floor

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- Flow manufacturing / kanbans
  - Reduce handling / movement
  - Reduce inventory
  - Greatly reduce lead-time
  - Reduce defects
- “Pull” system reduces overproduction and inventory

# Flow Manufacturing

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- Flow assumes process commonality
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  - Limits to scheduling / capacity
- **Limited applicability**

# Consider DBR

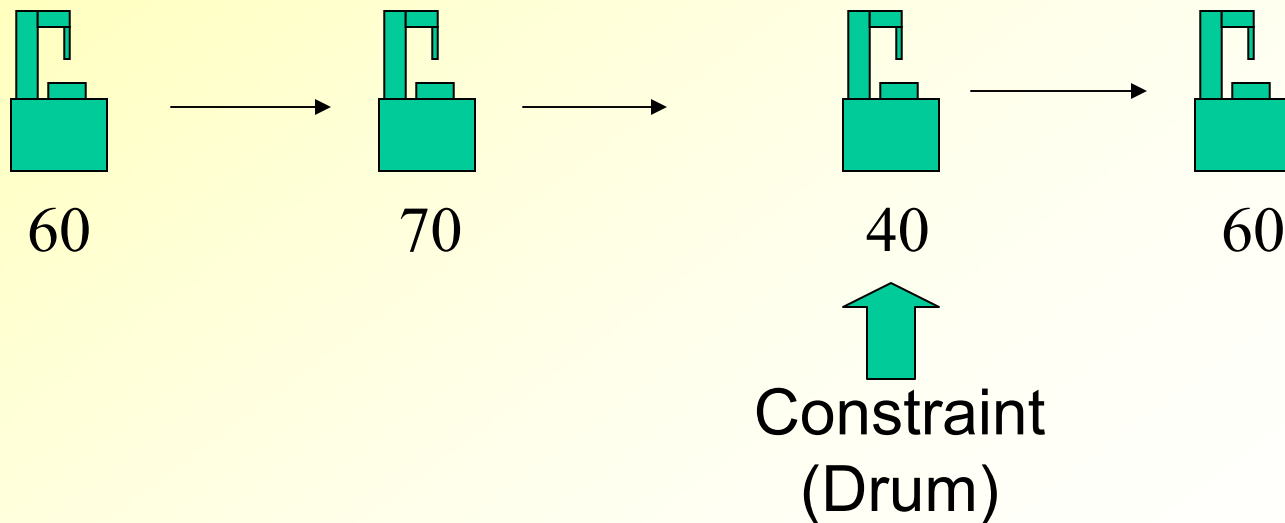
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- Drum-Buffer-Rope
  - Mechanism for applying Theory of Constraints (ToC)
  - As explained in “The Goal”

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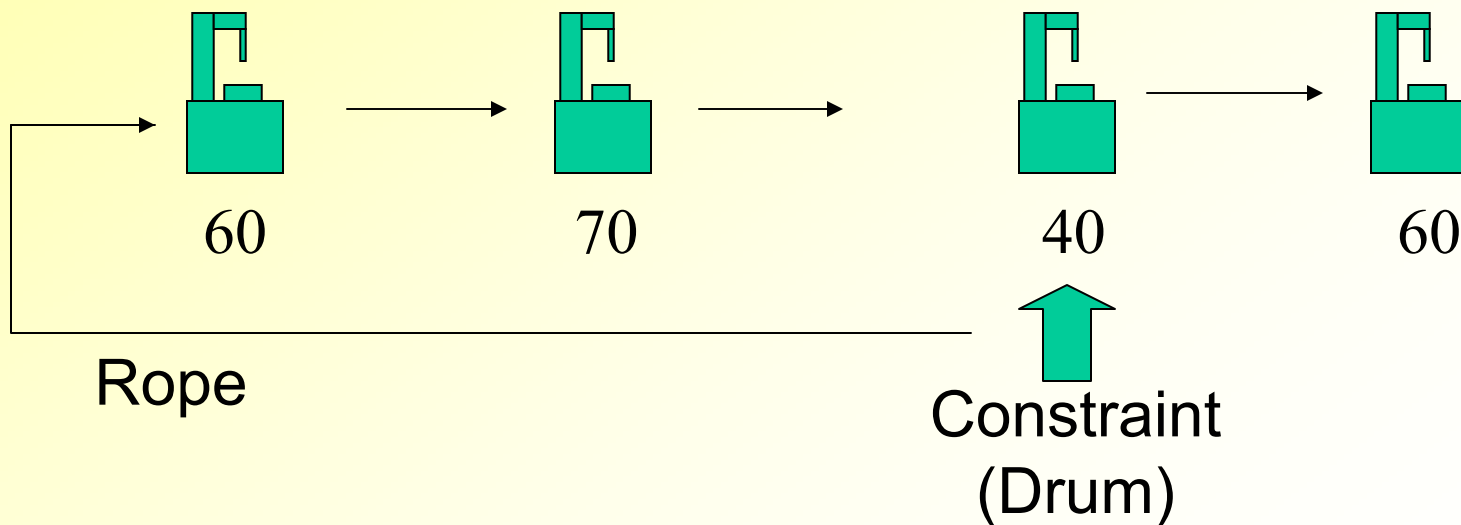
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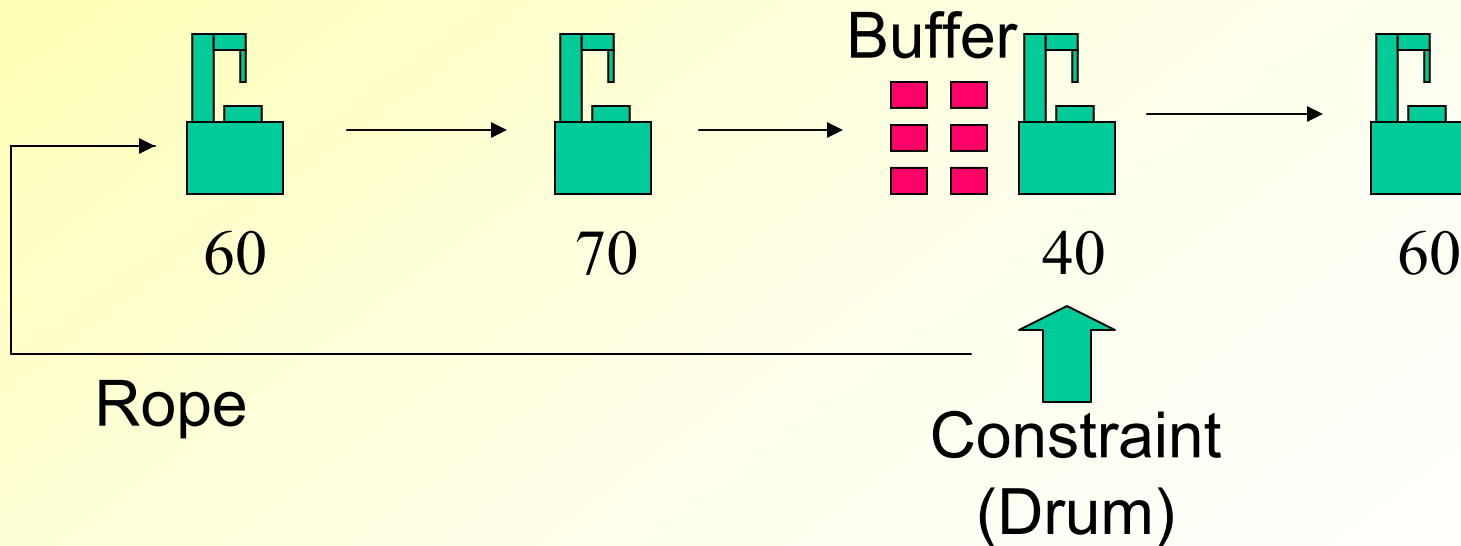
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- “Pull”
- Increased throughput
- Decreased lead-time
- Reduced inventory
- Customer service oriented

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- It is a focus on doing things differently to eliminate waste.
- Lean permeates the supply chain and does not mandate specific techniques or processes.
- **DBR fits well in support of a Lean initiative**

## Jim Womack says:

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- Simplify every process to minimize your need for information management.
- Make every step in your process capable and available.
- Schedule each value stream from only one point.
- Use reflexive production control upstream from the scheduling point.
- Send information in small batches.
- Make your information management transparent and intuitive.

# Simplified Market Pull (SMP)

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SMP is the generic name for an operating mechanism that helps **companies with excess capacity** achieve Lean Manufacturing benefits quickly and easily. SMP typically cuts lead-time and WIP inventory in half, and greatly increases on-time completions. It typically generates these benefits in a matter of weeks.

# Typical Situation

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- Market Constrained
  - More than enough capacity
- Yet still have trouble meeting due dates
- Why?

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**Too Much WIP**

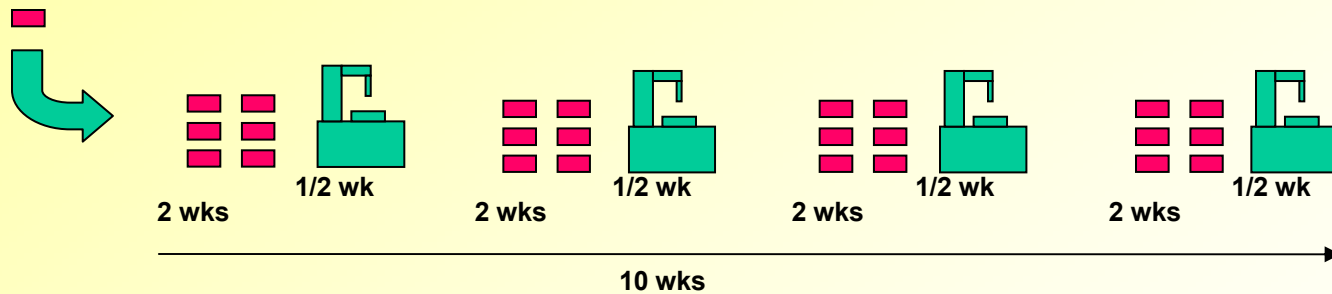
# How SMP Works

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- Greatly reduce WIP
  - Lead-time directly proportional to WIP

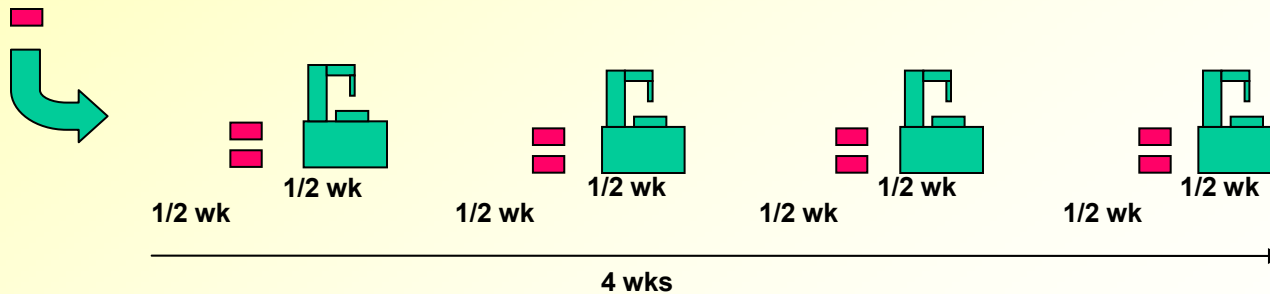
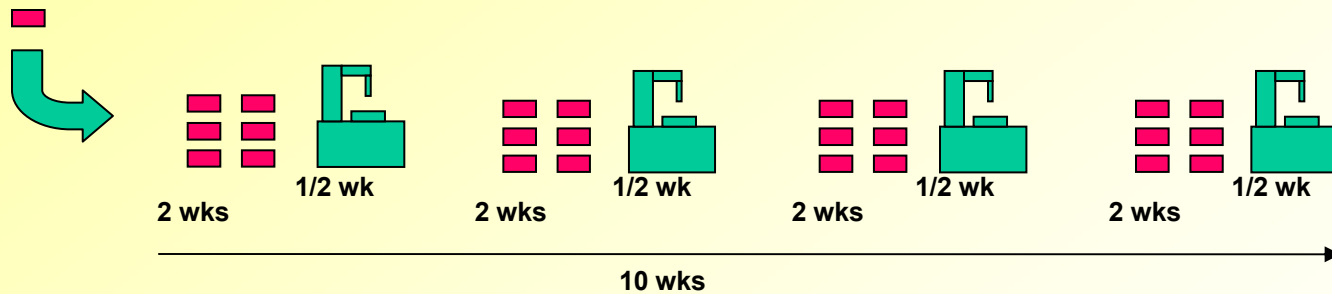
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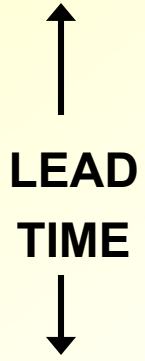
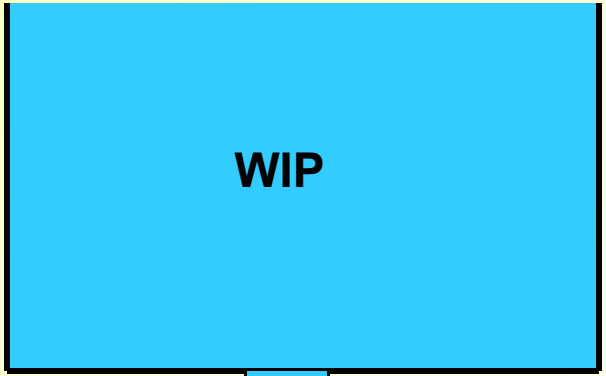
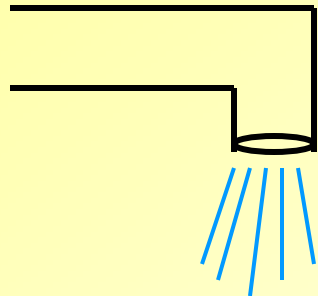
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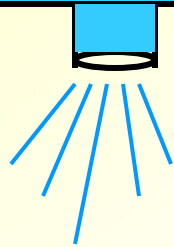
- Greatly reduce WIP
- WIP is there for a reason
- Maintain WIP & Lead-Time
  - Through controlled release of work
- Replace WIP with SMP controls
  - Dynamic priorities

# APICS Input/Output Analysis

INPUT

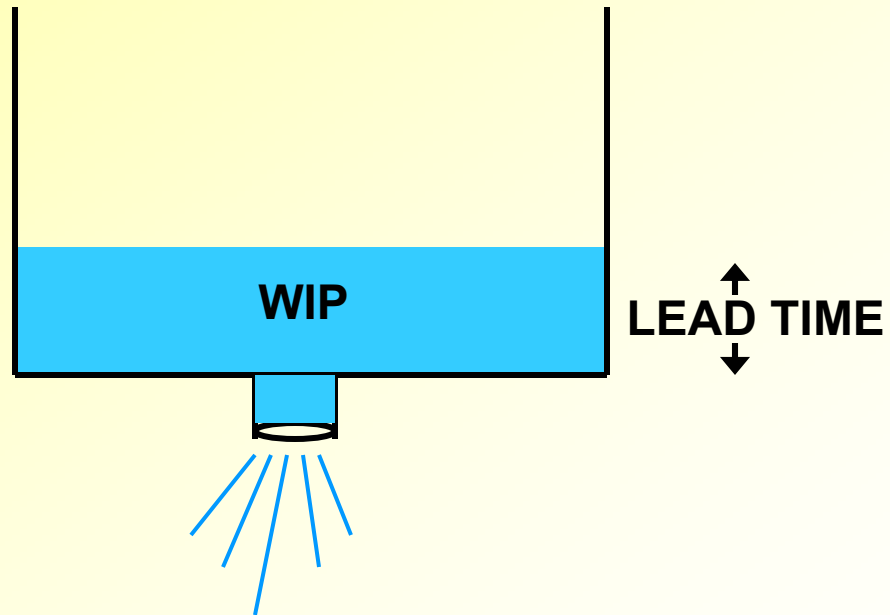
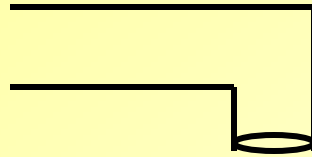


OUTPUT



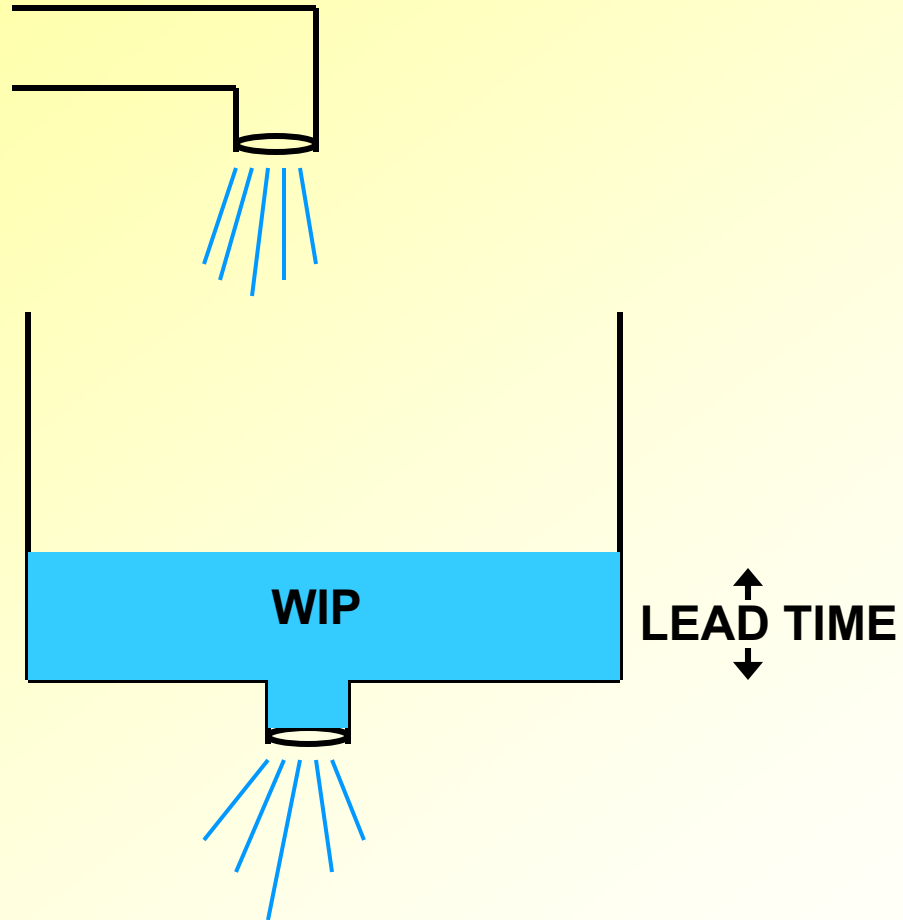
# Reduce Input/Maintain Output

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# Re-balance Input and Output

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# How SMP Works

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- Controls for the release of work
  - To the plant
  - At the ‘right’ time
- Controls for work flow
  - Dynamic priority system
  - Manages work using buffers for flexibility
  - Let’s you complete work on time

# Getting There

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- Implementation process reduces WIP
- As SMP takes effect, excess capacity starts to show through
- Must resist temptation to pull work in too soon, keep 'efficiency' high
- Can now sell excess capacity
  - Pressure is on the sales side

# The Follow-Through Step

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- Sell that freed-up capacity
- Be the only one in your market that delivers on time – and faster than the rest
  - You can probably get a premium price for that!
  - You should certainly be able to take business from competitors.
- Take additional business at lower price (but higher margin)
  - Once you understand marginal costs

# Marginal Costs

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- You are already paying labor and overhead
  - Assuming you have available capacity going unused

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- Scenario: Manufacturer has capacity available
  - Unit cost is **\$20 per unit**  
(**\$10.00 material, \$10.00 labor & overhead**)
  - There is a potential new order for **2000 units at \$17.50**

## The Difference...

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	Traditional Accounting	
Additional Units	2,000	
Unit Price / Revenue	\$17.50 / \$35,000	
Cost per unit / Total	\$20.00 / \$40,000	
Profit (Loss)	(\$5,000.)	

## The Difference...

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	Traditional Accounting	Throughput Accounting
Additional Units	2,000	2,000
Unit Price / Revenue	\$17.50 / \$35,000	\$17.50 / \$35,000
Cost per unit / Total	\$20.00 / \$40,000	\$10.00 / \$20,000
Profit (Loss)	(\$5,000.)	\$15,000

# Quick Results

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- Implementers have seen results almost immediately
  - “Shipped almost every order on time for the first time in the company’s 25 year history”
  - 50% to 90% lead-time reduction
  - Labor content reduced significantly
  - New (visible) capacity that can be utilized

# Simplified Market Pull (SMP)

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- A new TLA that we're introducing to the community
  - An addition to the “body of knowledge”
  - See the July/August issue of APICS magazine
- Quick and easy (simple) way to go “Lean”
- Applies to any company with excess capacity
- Quick (and impressive) results

# Simplified Market Pull (SMP)

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- Unique release and management system
  - “Pulls” work to customer requirements
  - Controls flow using appropriate, dynamic priorities
- Works for MTO and MTS
  - Time buffers for MTO
  - Inventory buffers for MTS
  - Dynamic priorities (recalculate as necessary)
  - Fine for mixed environment

## To Learn More:

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- Search “Lean Manufacturing” on the ‘net
- Read “The Goal”
- APICS Constraints Management SIG
- APICS magazine June/July issue “Lean Approach to Lean”
- Go to [www.daveturbide.com](http://www.daveturbide.com)
  - “Lean for MTO” (DBR) white paper
  - SMP White Paper

# Thank You

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www.daveturbide.com