



Lean Manufacturing Overview

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UW-STOUT MOC's History

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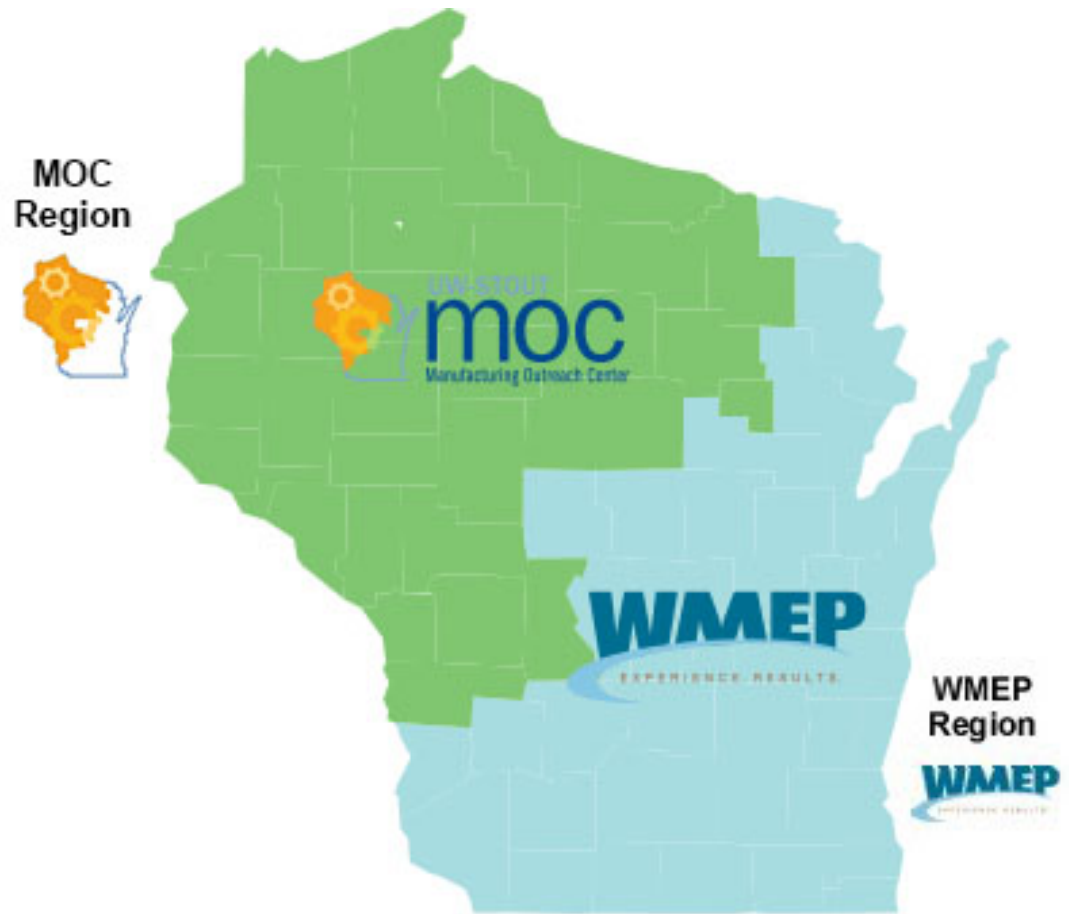
- **19XX – Began as Stout Technology Transfer Institute (STTI)**
- **1994 – Joined the National MEP system as the Northwest Wisconsin Manufacturing Outreach Center**
- **2010 – Became part of the Discovery Center at Stout**
- **2013 – Name changed to UW-Stout Manufacturing Outreach Center**

Area Served by UW Stout MOC

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**We serve
3,584 manufacturers in
33 Counties in
Northwestern Wisconsin
(blue shaded region)**

99% of manufacturers in these
counties are small and medium-
sized firms, employing fewer
than 500 people
More than 70% employ fewer
than 10 people



The Goals of the MOC

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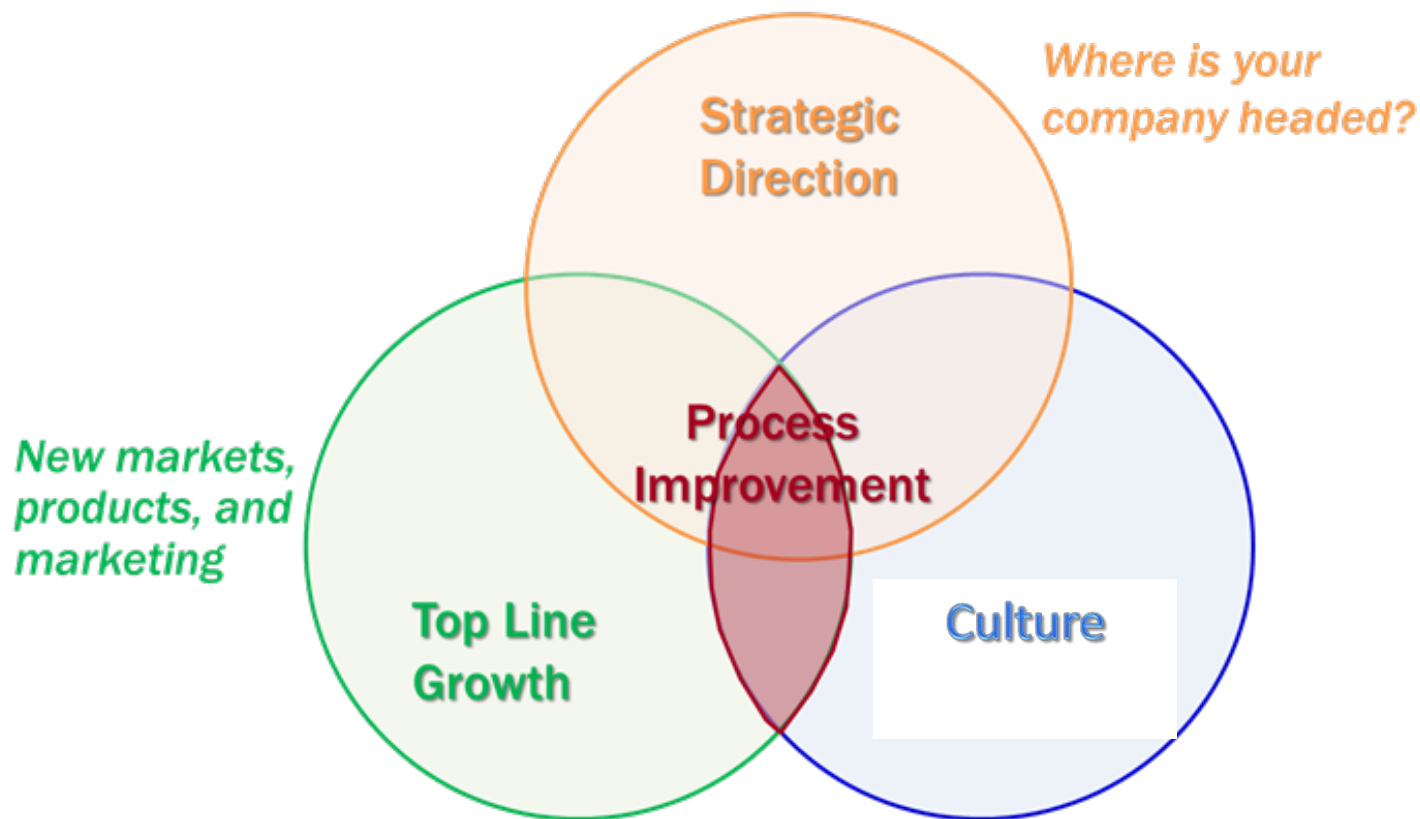
“Helping Manufacturers Succeed!”

“To develop competitive manufacturing companies in our region by bringing positive change and growth to our clients”

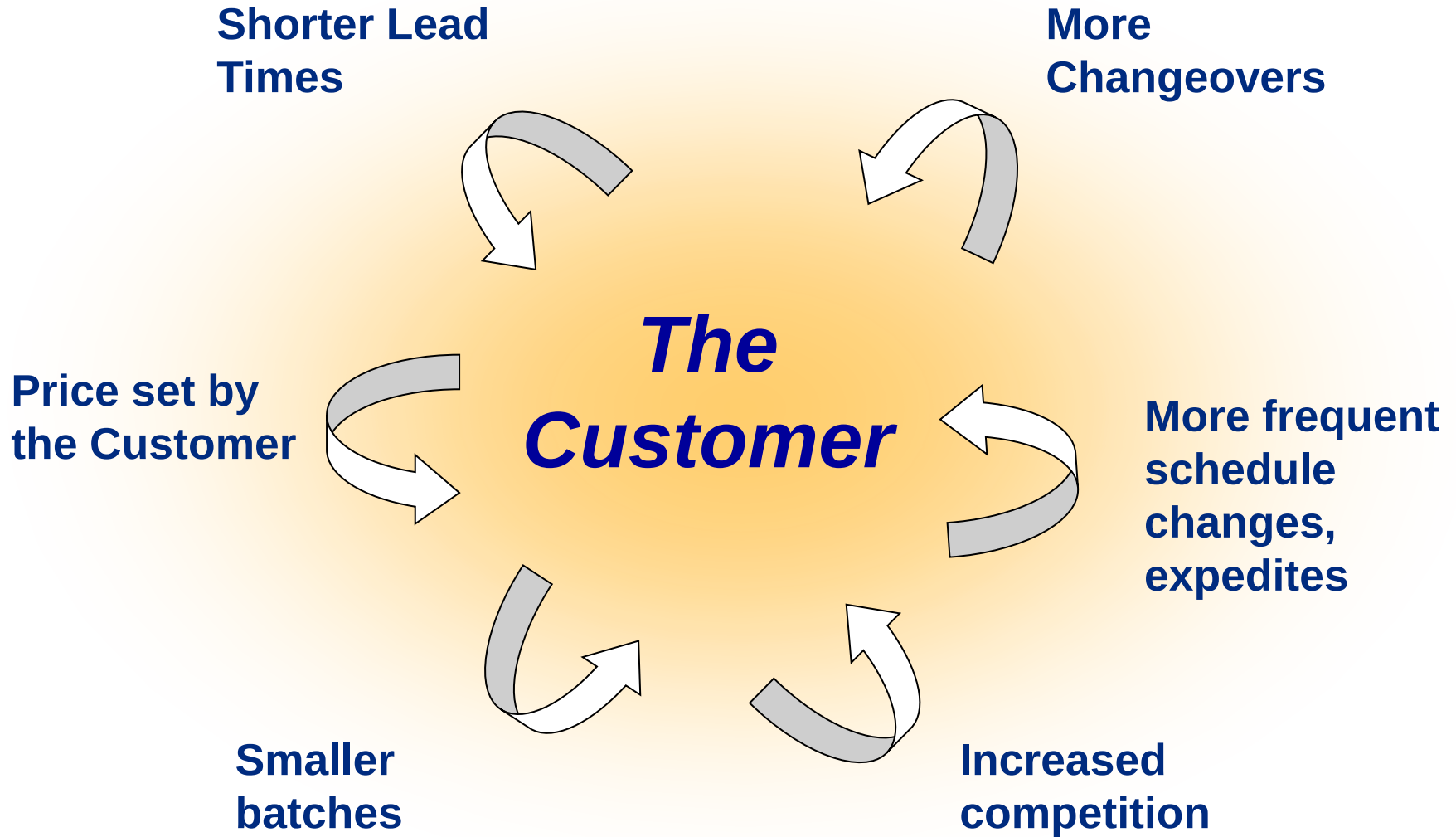
“To create and keep good jobs!”

UW-Stout MOC Services

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The World Today

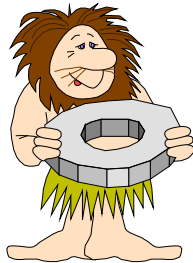


The “New Economy”

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- “Dictated” lower price
- Customers have more choices
- Highest quality
- Extreme customer connection
- More “value” to the customer

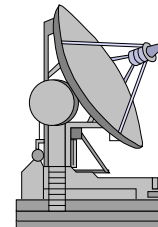
Past



Price Set By Manufacturer

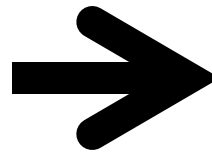
Cost + Profit = Price

Present



Price Set By Market

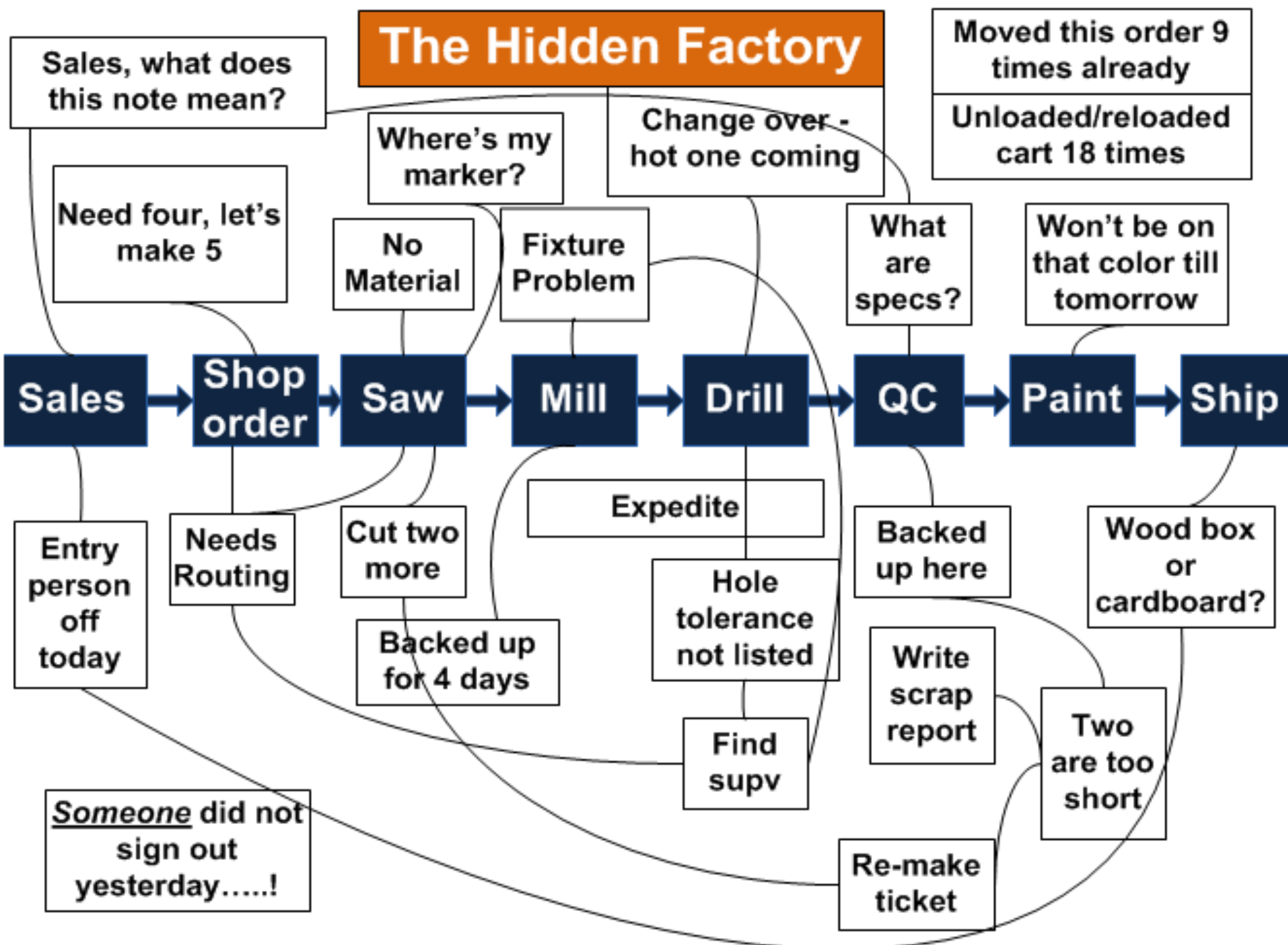
Price - Cost = Profit



The Factory



The Hidden Factory



Process Improvement – Lean Mfg.

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Lean →

“An enterprise-wide approach to identifying and eliminating waste (non-value added activities);

- through continuous improvement,
..... in pursuit of perfection,
- by flowing the product or service,
..... at the pull of the customer,
- with the involvement of everyone”.

Process Improvement – Lean Mfg.

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Value Added

Any activity that increases the market form or function of the product or service. i.e. Chip time, paint time, touch time. (These are things the customer is willing to pay for.)

Business Value Added

Any activity that is necessary to run the business.

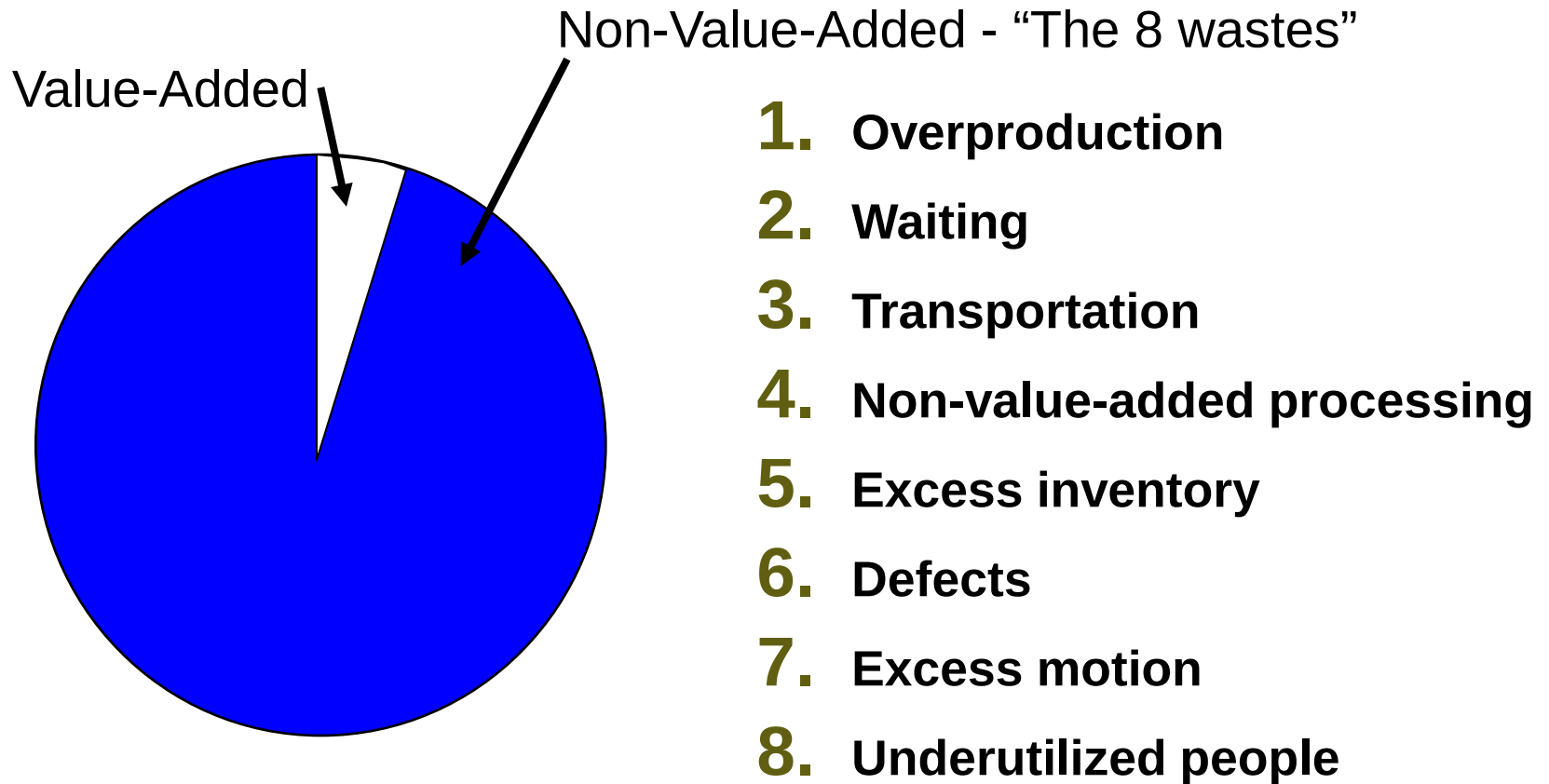
Examples: Financial, legal, payroll services, maintenance.

Non-Value Added

Any activity that does not add market form or function or is not necessary. (These activities should be eliminated, simplified, reduced, or integrated.)

Lean = Eliminating Wastes

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Typically 95% of all manufacturing lead time is non-value-added.

Waste in a Value Stream

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Value Stream: Every activity, from Beginning to End



Value Added Activities – Customer is willing to pay for



Non Value Added Activities – Customer is not willing to pay for

The downward pressure on price is because the customer does not want to pay for the “wastes” in the system

Waste in a Value Stream

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Value Stream: Every activity, from Beginning to End



Value Added Activities – Customer is willing to pay for



PO



Invoice



Waste Eliminated from the System



Non Value Added Activities – Customer is not willing to pay for

The downward pressure on price is because the customer does not want to pay for the “wastes” in the system

Waste in a Value Stream

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Value Stream: Every activity, from Beginning to End



Value Added Activities – Customer is willing to pay for



Non Value Added Activities – Customer is not willing to pay for

As Waste is Eliminated from the Value Stream, the Lead Time is Shortened and Invested Dollars Lowered!

Waste in a Value Stream

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Affect on Cash Flow



1. Overproduction

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- Making more than is required by the next process
- Causes of overproduction



1. Overproduction

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- Making more than is required by the next process
- Causes of overproduction
 - Just-in-case we need it
 - Misuse of automation - run too fast
 - Long process setup
 - Unlevel scheduling
 - Unbalanced workload
 - It just feels right to make more while it is going good



2. Waiting Waste

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- Idle time waiting for... ?????
 - People waiting
 - Product waiting



2. Waiting Waste

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- Idle time waiting for... ?????
 - People waiting
 - Product waiting
- Causes of waiting waste
 - Unbalanced workload
 - Unplanned maintenance
 - Long setup times
 - Upstream quality problems



3. Waste Of Transportation

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- **AROUND THE PLANT** - Transporting parts, materials, information, paperwork



3. Waste Of Transportation

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- **AROUND THE PLANT** - Transporting parts, materials, information, paperwork
- Causes of transportation waste
 - Poor plant layout
 - Inefficient process design



4. Processing Waste

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- Effort that adds no value to the product or service from the customers' viewpoint



4. Processing Waste

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- Effort that adds no value to the product or service from the customers' viewpoint
- Causes of processing waste
 - True customer requirements not clearly defined, like tolerances that are too tight
 - Extra copies/excessive information (handling paperwork is a waste too!)



5. Inventory Waste

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- Any supply in excess of a one-piece flow through your manufacturing process



5. Inventory Waste

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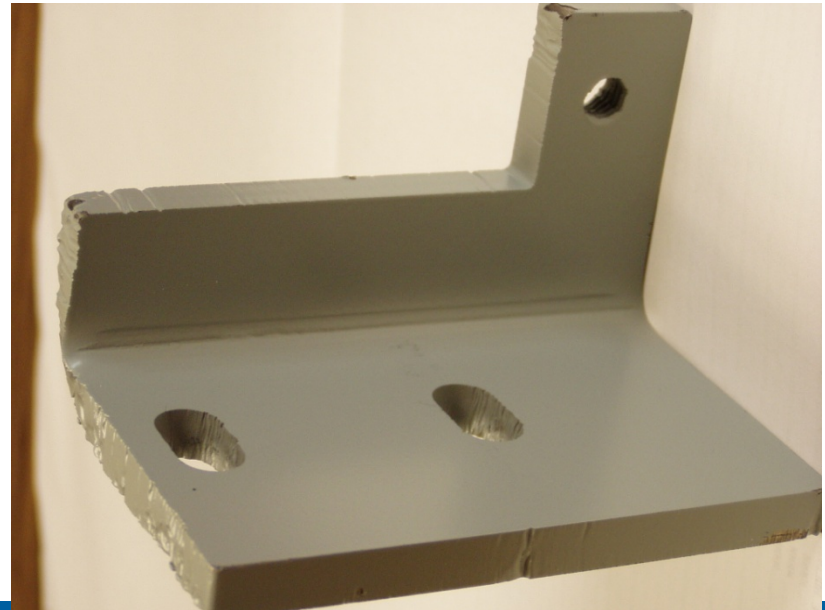
- Any supply in excess of a one-piece flow through your manufacturing process
- Causes of excess inventory
 - Buffer against expected problems
 - Scheduling system
 - Plant layout
 - Reward system



6. Defects

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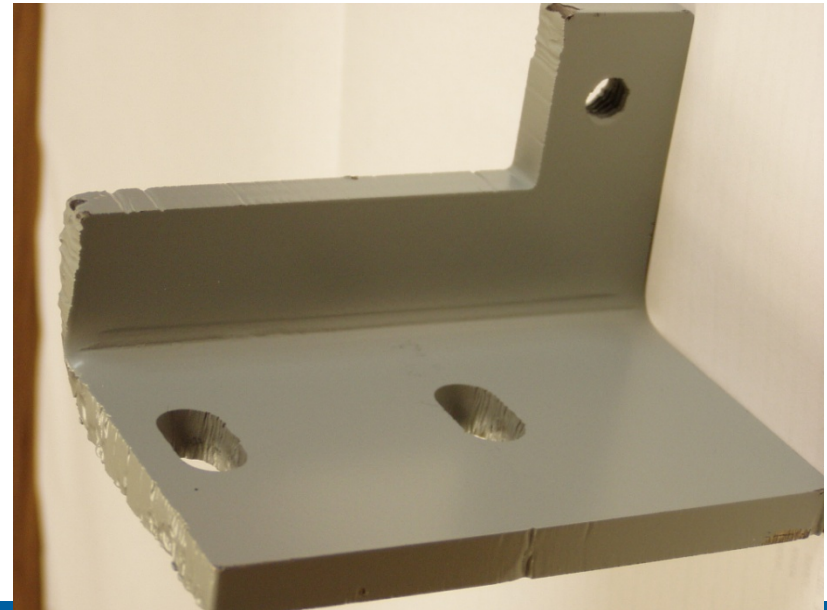
- Making a product incorrectly



6. Defects

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- Making a product incorrectly
- Causes of defects
 - Weak process control
 - Quality not built in at each process step
 - Machine maintenance, performance
 - Inadequate education / training / work instructions
 - Product design hard to make



7. Motion Waste

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- **WITHIN YOUR WORK AREA** - Any movement of people or machines that does not add value to the product or service



7. Motion Waste

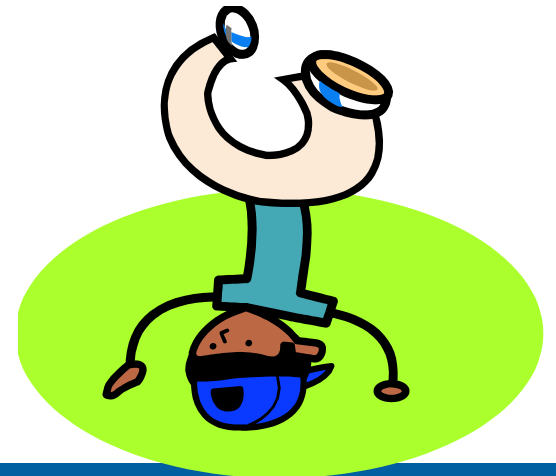
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- **WITHIN YOUR WORK AREA** - Any movement of people or machines that does not add value to the product or service
- Causes of motion waste
 - Inconsistent work methods
 - Unfavorable layout
 - Poor workplace organization and housekeeping



8. People Waste

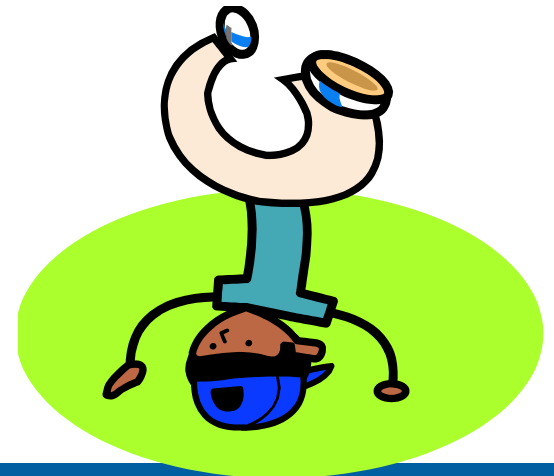
- The waste of not using people's mental, creative, and physical abilities



8. People Waste

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- The waste of not using people's mental, creative, and physical abilities
- Causes of people waste
 - The business culture
 - Wrong person for the job
 - Inadequate training



Waste

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Think of Waste as

hidden,
underutilized,
or dormant assets

waiting to be turned into

customer satisfaction,
sales,
and profit.

Convert Waste to Value: An Example

- 15 minutes to find something, 30 seconds to cut it



High Performing Organization

GOALS:

Constantly improve cost, quality, speed.
Satisfy the Customer, Create Value

TOOLS

Improve the Process
Reduce Waste
Solve Problems

Value Stream Mapping
Workplace Organization
Visual Systems
Equipment Reliability
Pull/Kanban
Scheduling
Quick Changeover
Quality
Error Proofing
Standardized Work
Process Control
Ergonomics
Proper Equipment
Create Flow

CULTURE

Continuous Improvement
Respect for People
Empowerment

Kaizen Teams
Improvement Teams
Ongoing Work Teams
Learning Organization
People Development
Sharing Information
Stated Values
All-One-Team
Time to Reflect
Process Thinking
Team Presentations
Culture of Mentoring
Best Safety
Embrace Change

STRUCTURE

Organizational Structure
Provide Resources
Keeper of the Vision

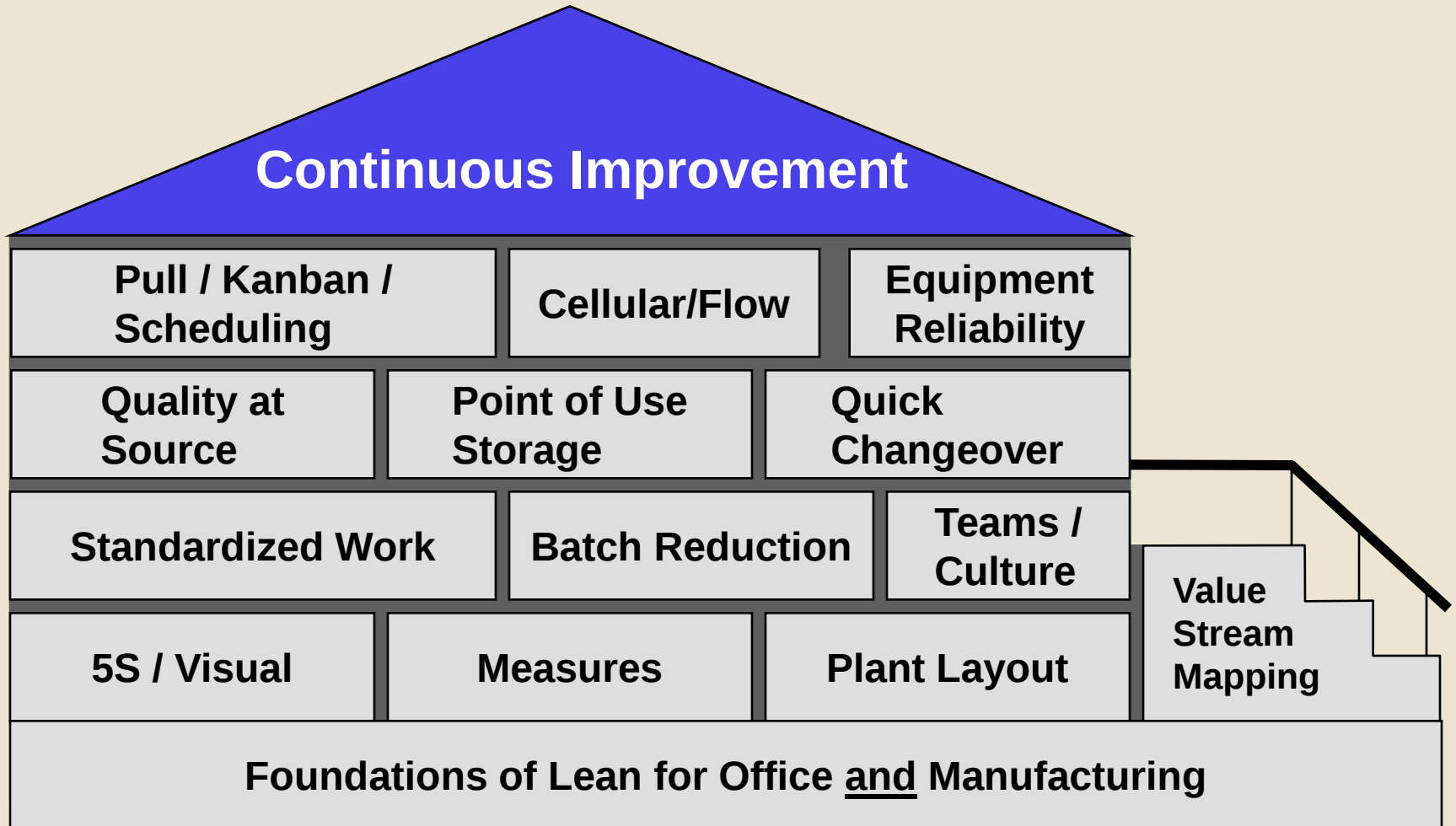
Right People
Shared Rewards
Decision Making
Performance Measures
Value Stream Leaders
Common Goals
Succession Plan
Strategic Plan
Provide Direction
Key Objectives
Encourage Teams
Mentoring
Marketing Plan
Continual Renewal

GUIDING PRINCIPLES:

Respect, Openness, Honesty, Integrity
To make a positive impact on people's lives

Learn Continuously -- Embrace Change

Lean Tactical Building Blocks



The Question“How CAN we make it work?”

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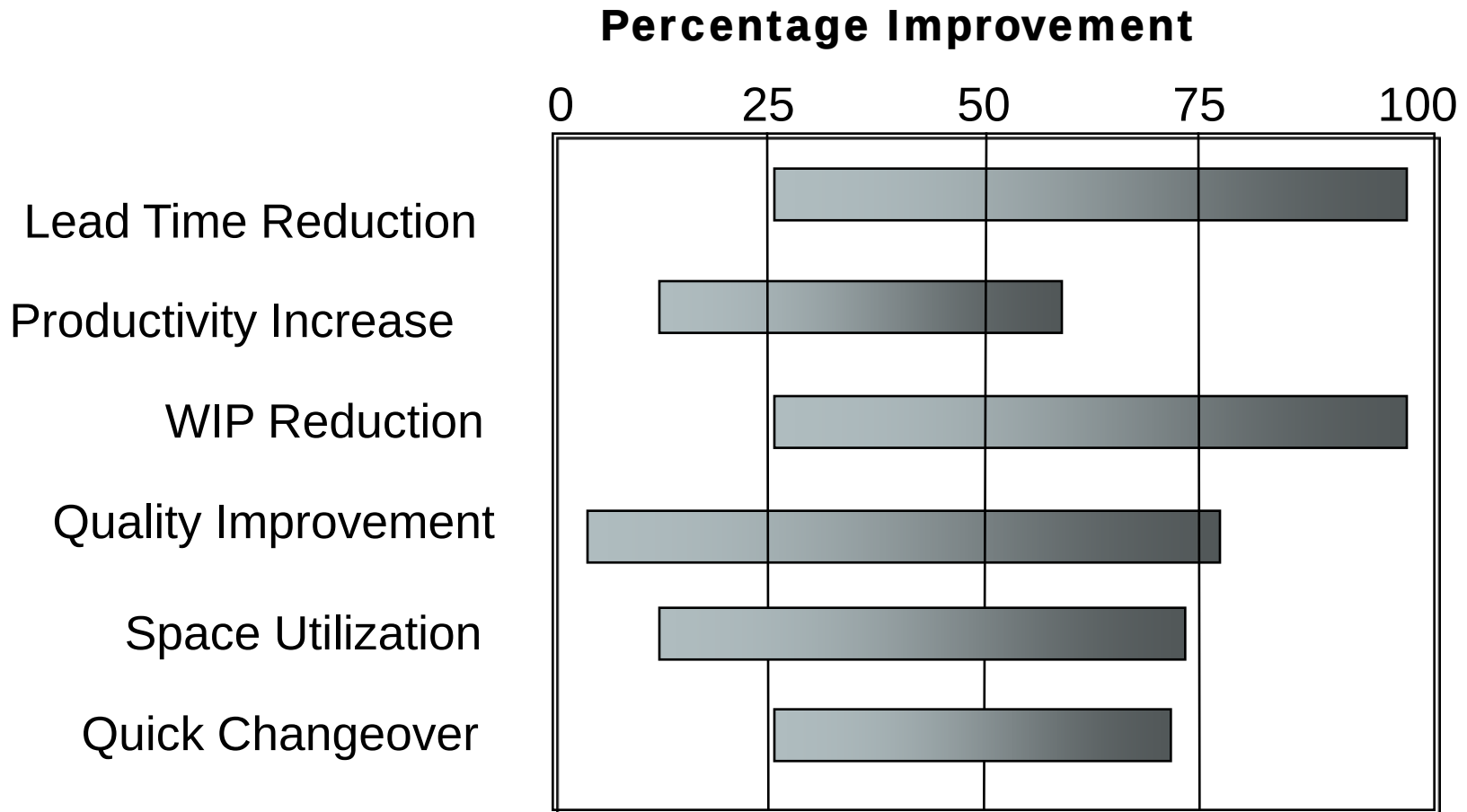
Keys To Success

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- People are the key!
 - Common understanding of the need to change
 - Trained and truly empowered people
 - - Create a culture of continuous improvement
- Identify and empower champions to remove roadblocks
- Atmosphere of experimentation
 - Fault Tolerance
 - Forgiveness; May need to say 'I'm sorry'
 - Patience
- Have goals
- Create flow

Typical Benefits

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Possible Lean Tools

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5S Workplace Organization - A series of activities designed to improve workplace organization and standardization: sort, set in order, shine, standardize, sustain.

Cellular Flow Manufacturing - A process to link manual and machine operations into the most efficient combination of resources to maximize value-added content while minimizing waste.

Lean Office - A set of guidelines to improve office function by eliminating bottlenecks and waste.

Lean Overview - Learn how to reduce costs, achieve work standardization, decrease changeover time, improve safety, reduce storage costs, reduce machine downtime, and boost employee morale as well as work environment.

Pull Systems / Kanbans - A system to control the flow of resources in a production process by replacing only what has been consumed. Helps eliminate waste in handling, storing, and delivering your product to the consumer.

Setup / Changeover Reduction - A process to aid the ability to change from one product to another in order to meet customer demands for high-quality, low-cost products, delivered quickly and without the expense of excess inventory.

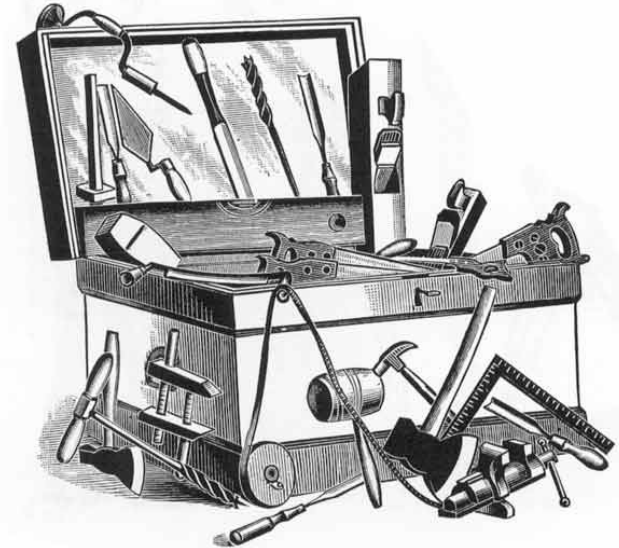
Total Productive Maintenance - A process designed to maximize the productivity of your equipment for its entire life.

Value Stream Mapping - A tool to map the flow of products that enables companies to streamline work processes, cutting lead times and reducing operating costs.

Possible Tools To Reduce Waste

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1. Five S
2. Point of Use Storage
3. Visual Controls
4. Standardized Work
5. Value Stream Mapping
6. Batch Size Reduction
7. Work Cells / One-Piece Flow
8. Quick Changeover
9. Quality at the Source
10. Kanban / Pull Scheduling
11. Equipment Reliability
12. Company Culture
13. Plant Layout
14. Key Indicators & Metrics



These work on the shop floor and in the office environment!

Save the Date!

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7th Annual Manufacturing Advantage Conference October 1-2, 2014

www.uwstout.edu/profed/mfg







Thank You!

Contact Us:

UW-Stout Manufacturing Outreach Center

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Helping manufacturers
SUCCEED

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