

Introduction to Lean and Environment

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Definition of Lean

A systematic approach to identifying and eliminating waste (non-value-added activities) through continuous improvement by flowing the product at the pull of the customer in pursuit of perfection.” - The MEP Lean Network

Value Added

Any activity that increases the market form or function of the product or service. (These are things the customer is willing to pay for.)

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.)

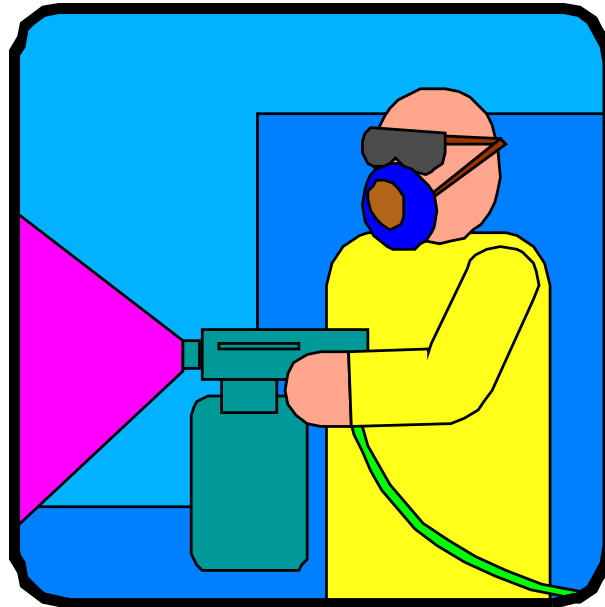
Value Added

- Value Added is NOT about a persons value to the company
- Non-value added does not mean unnecessary
 - Example: Preparation of Taxes for a chair manufacturing company is necessary, but the customer doesn't want to pay for it.
 - The accountant task is non-value added, but the accountant is still valuable.

Surface Coating

Input

- Metal parts
- Paint
- Spray guns
- Filters
- Solvent
- Water
- Shop rags



Output

- Painted parts
- VOCs to air
- Loaded filters
- Dirty guns
- Dirty rags
- Spent solvent
- Packaging
(cans, cardboard)
- Wastewater
- Sludge
- Painted Parts

Seven Deadly Wastes

1. **Transportation**
2. **Inventory**
3. **Motion**
4. **Waiting**
5. **Overproduction**
6. **Over Processing**
7. **Defects**

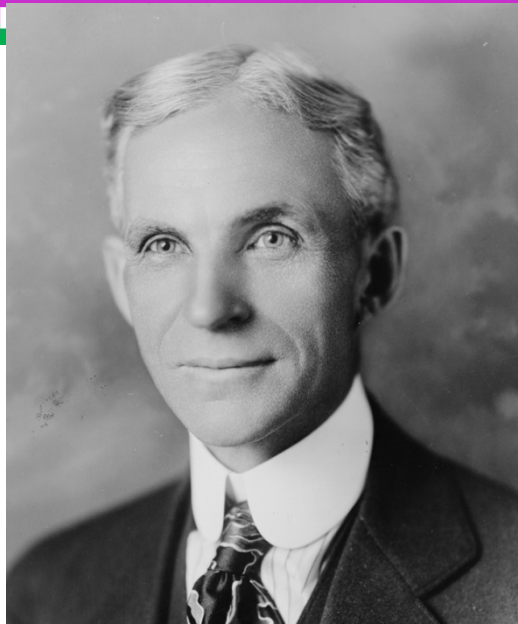
Which Waste are the following

Seven Deadly Wastes

- 1. Transportation**
- 2. Inventory**
- 3. Motion**
- 4. Waiting**
- 5. Overproduction**
- 6. Over Processing**
- 7. Defects**

- 1. Paint on a paint filter?**
- 2. Compliance with environmental laws?**
- 3. Ordering paint?**
- 4. Shipping paint?**
- 5. Carrying the paint across the floor?**
- 6. Paint on Product**
- 7. Storing the paint?**

History

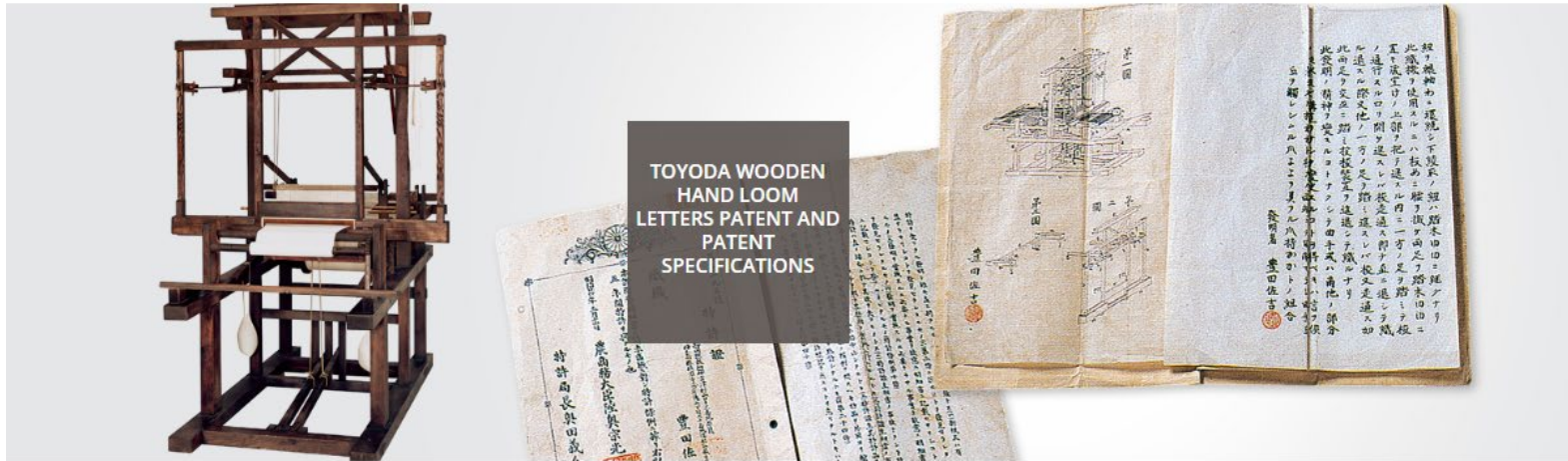


Benjamin Franklin

Henry Ford

Sakichi and Kiichiro Toyoda (豊田 佐吉)

Toyoda Loom



TOYODA WOODEN
HAND LOOM
LETTERS PATENT AND
PATENT
SPECIFICATIONS

www.toyota-industries.com/company/history/toyoda_sakichi/



OKKAWA MEMPU
COMPANY

Total Productive Maintenance (TPM)

- Systematic approach to the elimination of equipment downtime as a waste factor
- Enlisting the intelligence and skills of the people who are MOST familiar with the factory machines: the equipment operators
- Charting/analyzing equipment performance to identify root cause of problems, and implementing permanent corrective actions

Key Strategy: Environmental Integration

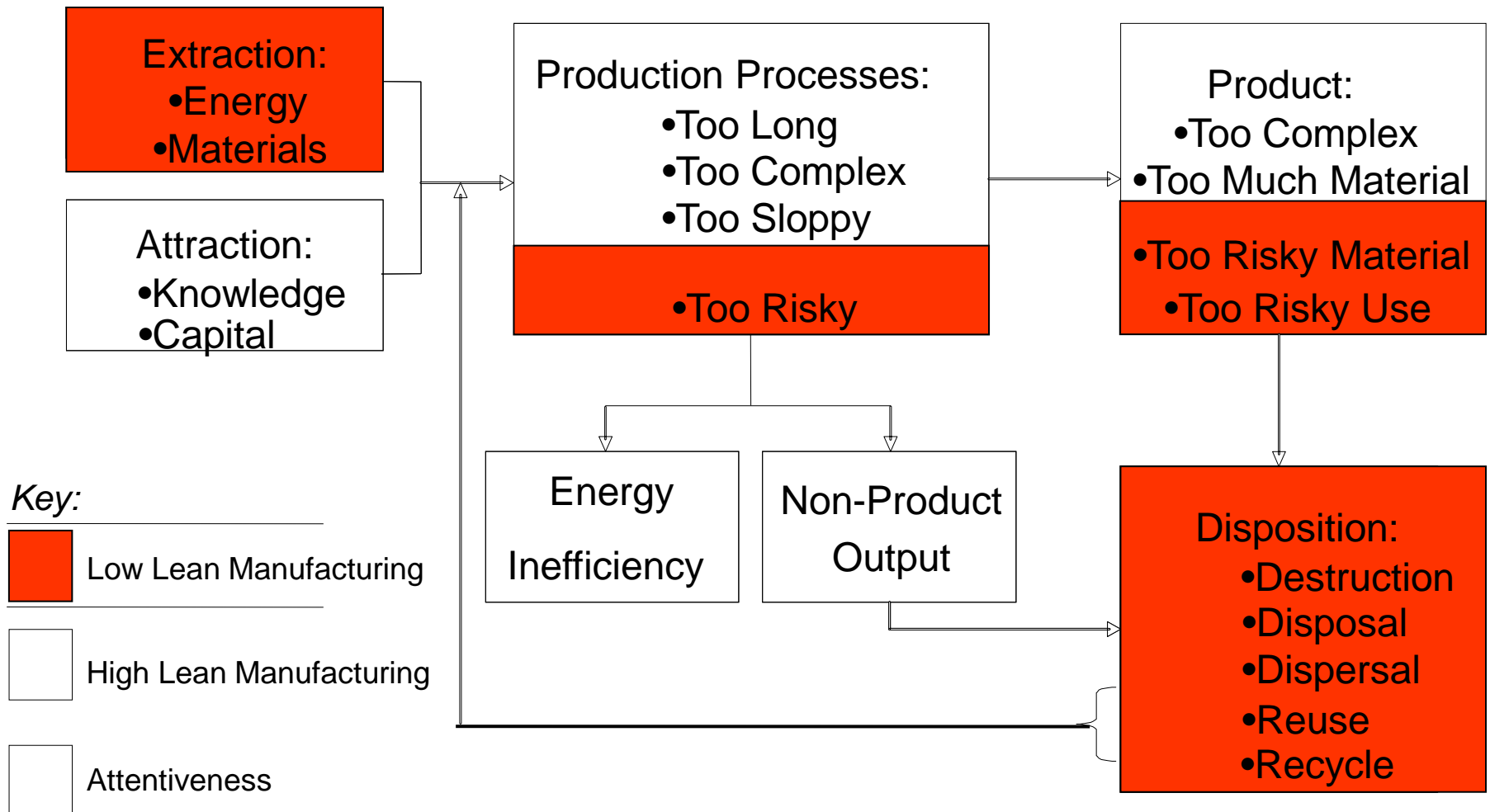
**Don't Try to Add
Environmental on Top of
Business**

**Make the Environment
Part of Business**

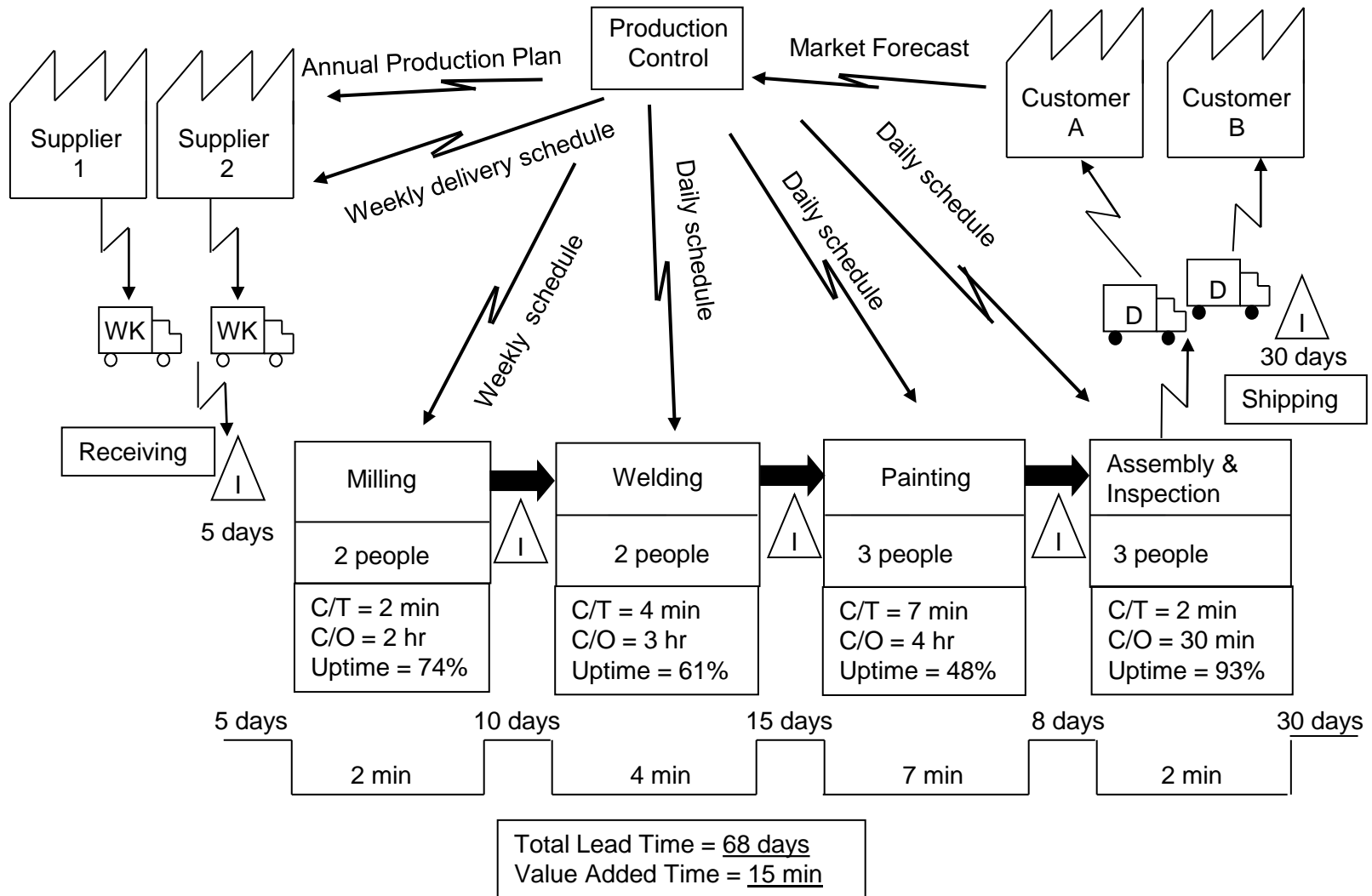
Why Combine Environment with Lean?

- Reduce non-product output
- Include hidden costs
 - Environmental “overhead” is non-value added
- Respect for people is one of the core principles of lean

Lean Blind Spots: Risk and Impacts



Value Stream Map



Value Stream Mapping



Helps prioritize projects

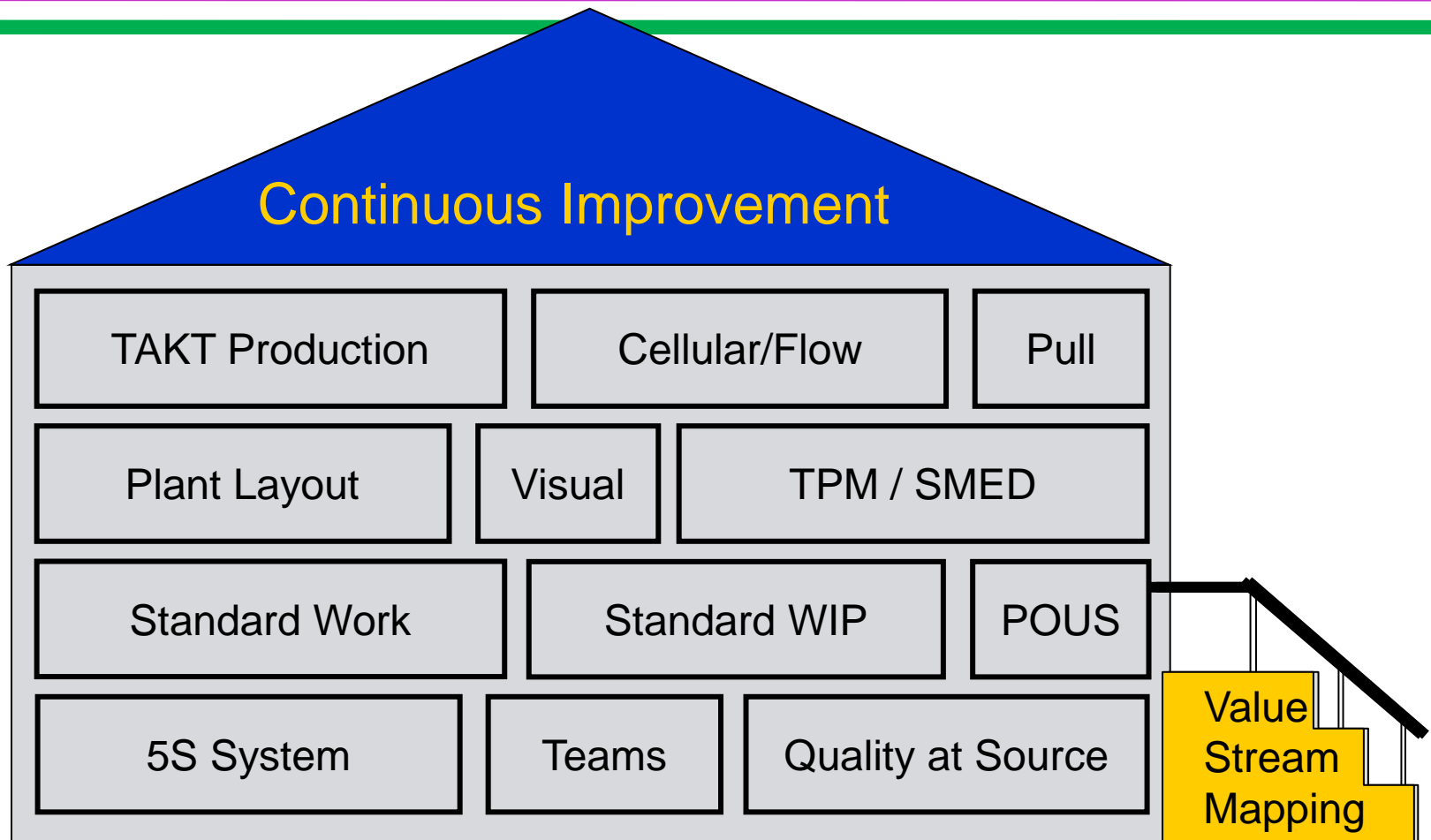


Helps identify largest wastes



Can add environmental element

Lean Building Blocks



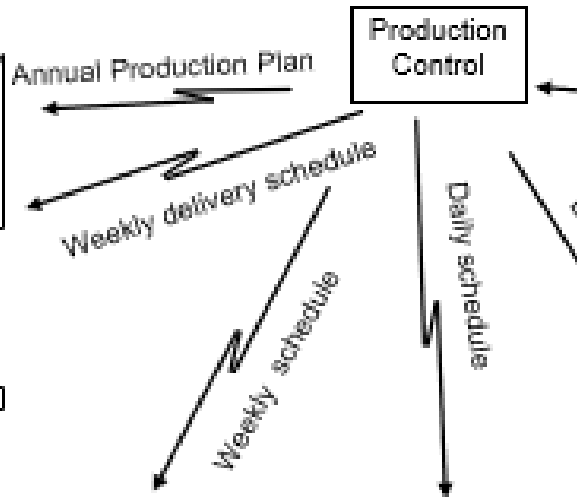
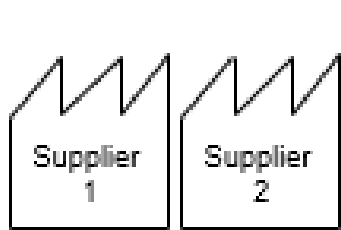
Strategies for Adding Environment to Lean

Basic Lean Training

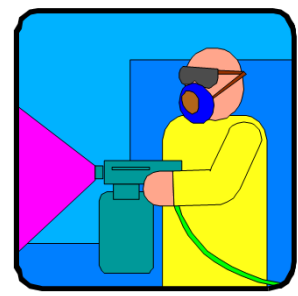
- Show how to identify environmental wastes
- Practice this on process maps
- Discuss the waste management hierarchy
 - *Dispose -> Treat -> Recycle -> Reuse -> Reduce*
- Share examples of how lean can reduce hazardous wastes

Value Stream

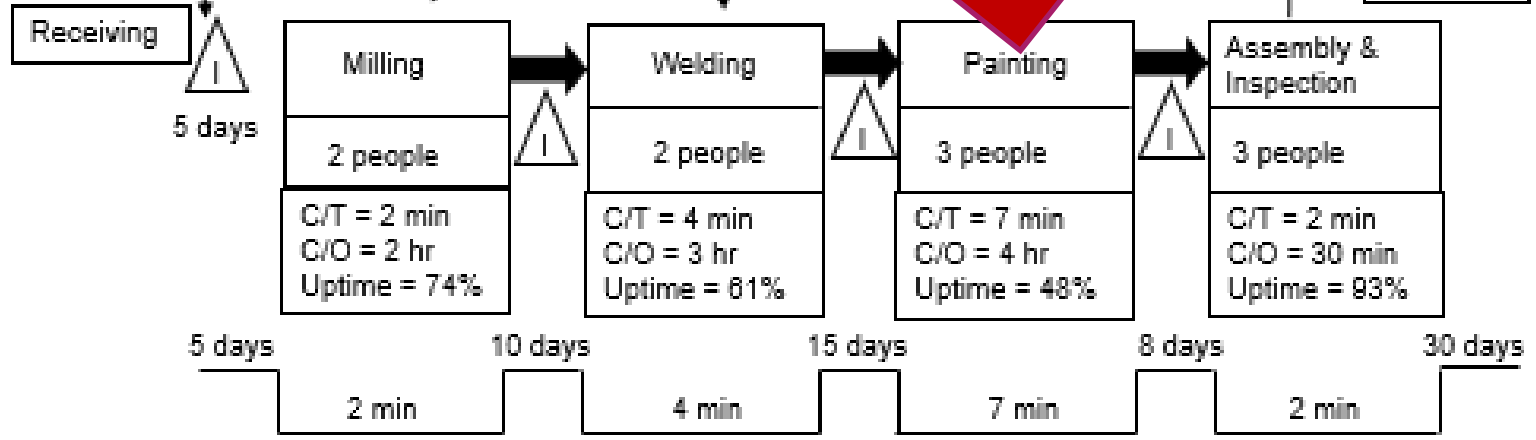
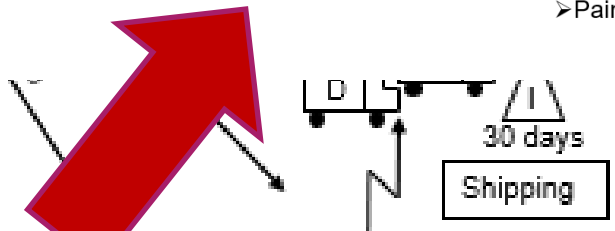
Coating Process (Painting)



- Inputs
- > Water
 - > Packaging
 - > Paint Filters
 - > Spray Heads
 - > Steel Parts
 - > Shop Rags
 - > Energy
 - > Labor



- Outputs
- > Sludge
 - > Wastewater
 - > VOCs to air
 - > Used Paint Filters
 - > Empty Paint Cans
 - > Cardboard
 - > Dirty Rags
 - > Dirty Spray Heads
 - > Scrap Steel
 - > Painted Parts

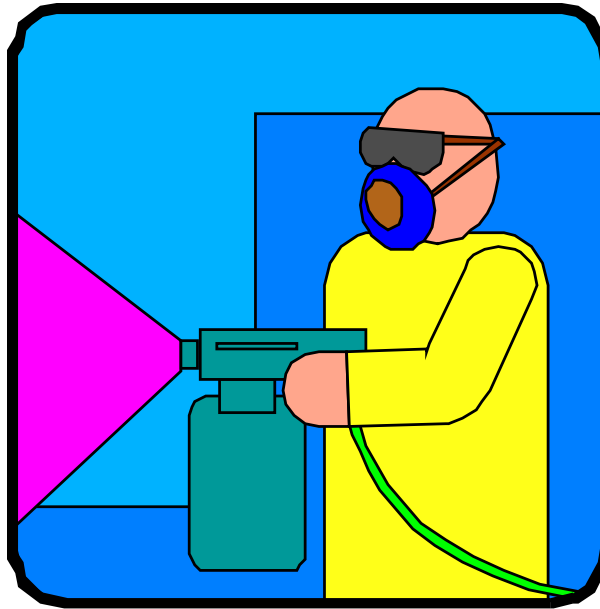


Total Lead Time = 88 days
Value Added Time = 15 min

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Strategies for Adding Environment to Lean

- **Add “Environmental” icons or flags**
- **Record environmental measures and costs**
- **Involve the environmental staff**
- **Process Mapping**
- **Make the **full cost** of environmental waste visible in report-out to management!**
 - *Costs, charts, photos*

Upcoming Training

University of Texas – Arlington

- October 14-15, 2021
- November 11-12, 2021

<https://webded.uta.edu/wconnect/CourseStatus.awp?&Course=etihom>

GreenUP! Metal Manufacturing Training

- Lean courses throughout, contact me for more.