



# *The Value of Cellular Manufacturing*

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# ***We Love Infrastructure***





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# Locations Around the World





# Let's Talk Lean...





# Does this look Lean?





# What is Lean Truly About?

- Doing More **with Less**
- A lot of **Kaizen** projects
- Resource **utilization**
- Keeping people **busy working**
- **Kanbans**
- Focus **on** being “On-time”
- Value **Stream** Meetings
- Training **Employees to** Gain Buy-In



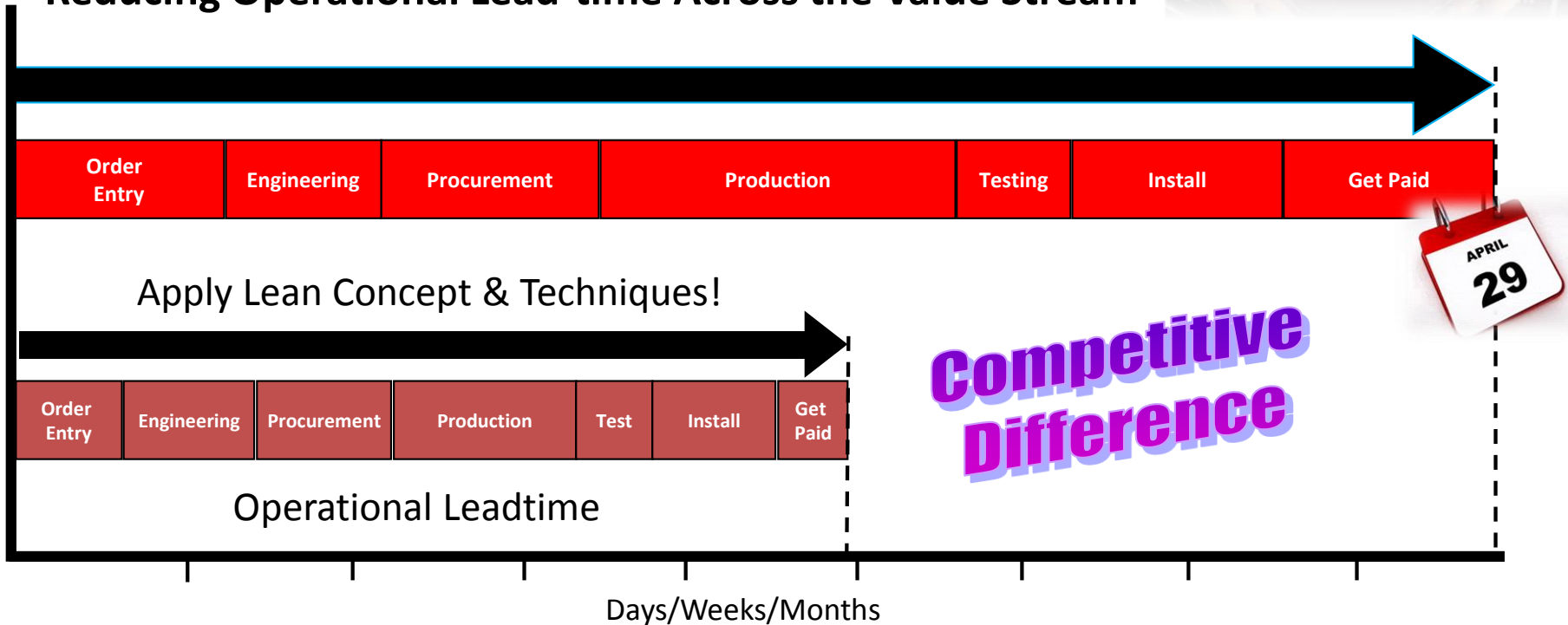
# It's About Time





# It's About Time

Reducing Operational Lead-time Across the Value Stream



Customers Will Feel This Difference



# Takt & Cycle Times

Orders



**Cycle Time** = Avg. time for each unit to make its way through to the bucket

**= 50 Hrs.**

Less stuff requires Less Space

+ there will be fewer drownings!

WIP

Inventory

**50 Gallons**

Shipments



**Takt Time**  
= Demand Rate

**1 Gal. / Hr.**



# Takt & Cycle Times

Orders



**Cycle Time** = Avg. time for each unit to make its way through to the bucket

= 50 Hrs.

Cycle Time = Ability to respond to customer needs

What if 1 Gal. /Hr. is not enough?

A. Add another line

B. Open up the spigot



50 Gallons

Shipments

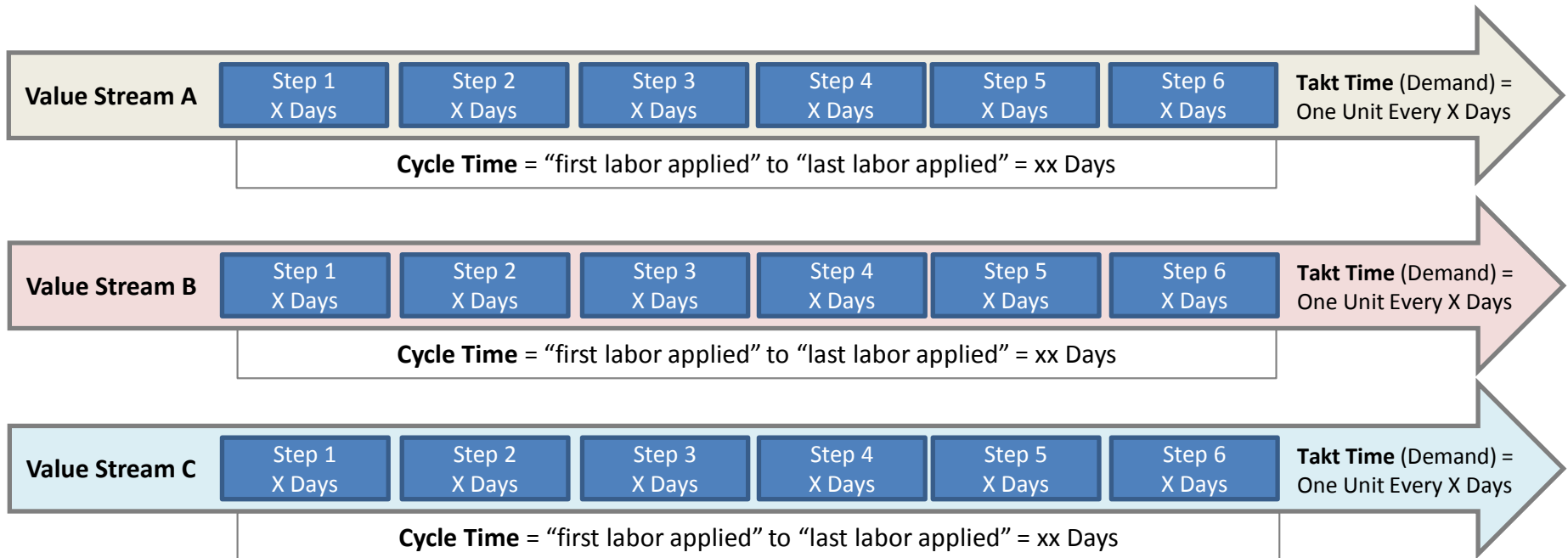


**Takt Time**  
= Demand Rate

1 Gal. / Hr.



# Open up the Spigot



If Demand is 120 Units this year, Takt = 3 Days



# Open up the Spigot

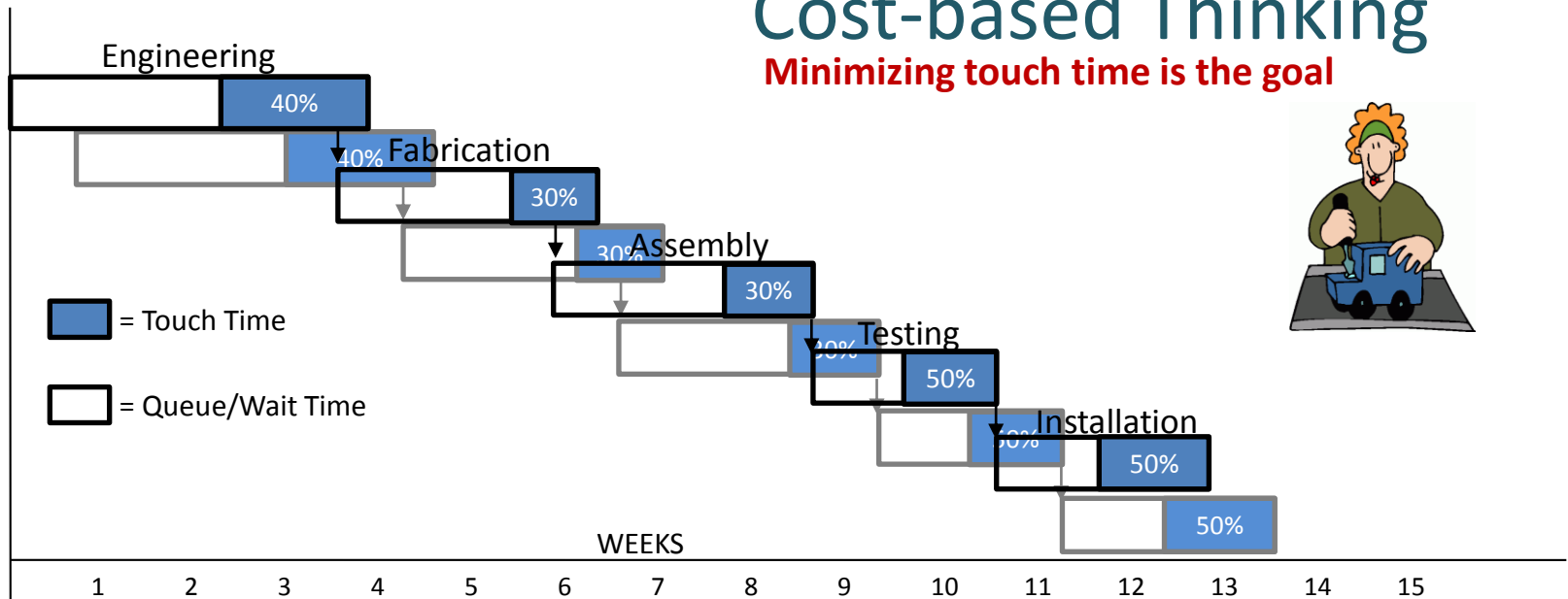


Learn to be comfortable with less WIP!



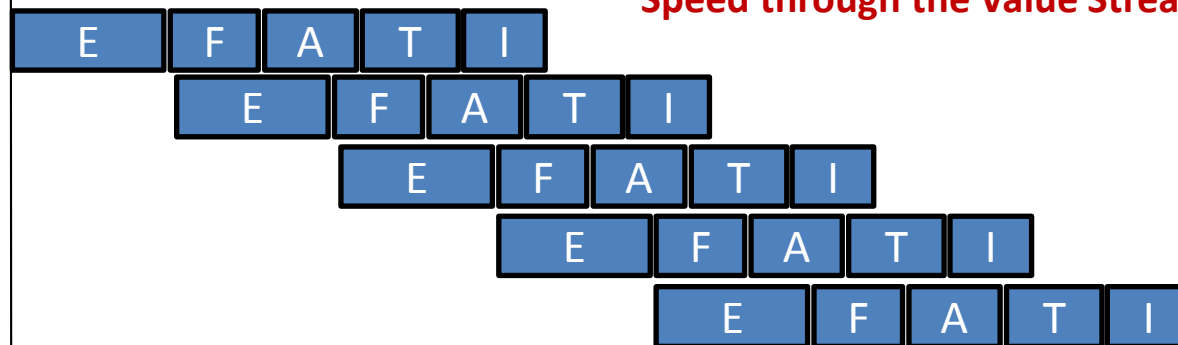
## Cost-based Thinking

Minimizing touch time is the goal



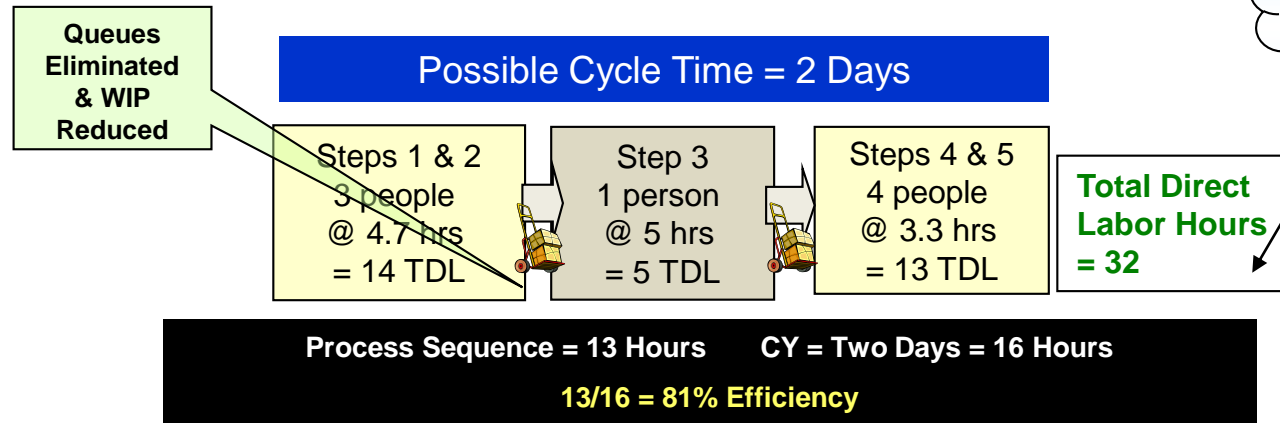
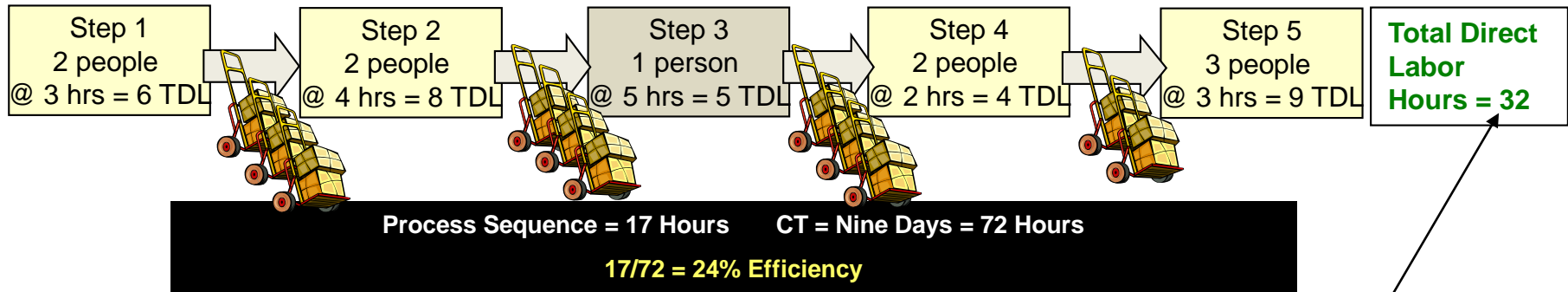
## Time-based Thinking

Speed through the Value Stream is the goal





Existing Cycle Time = 9 days (One 8-hour shift per day)

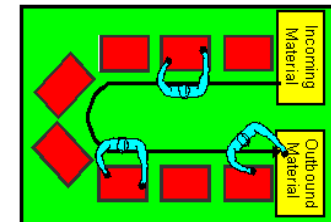


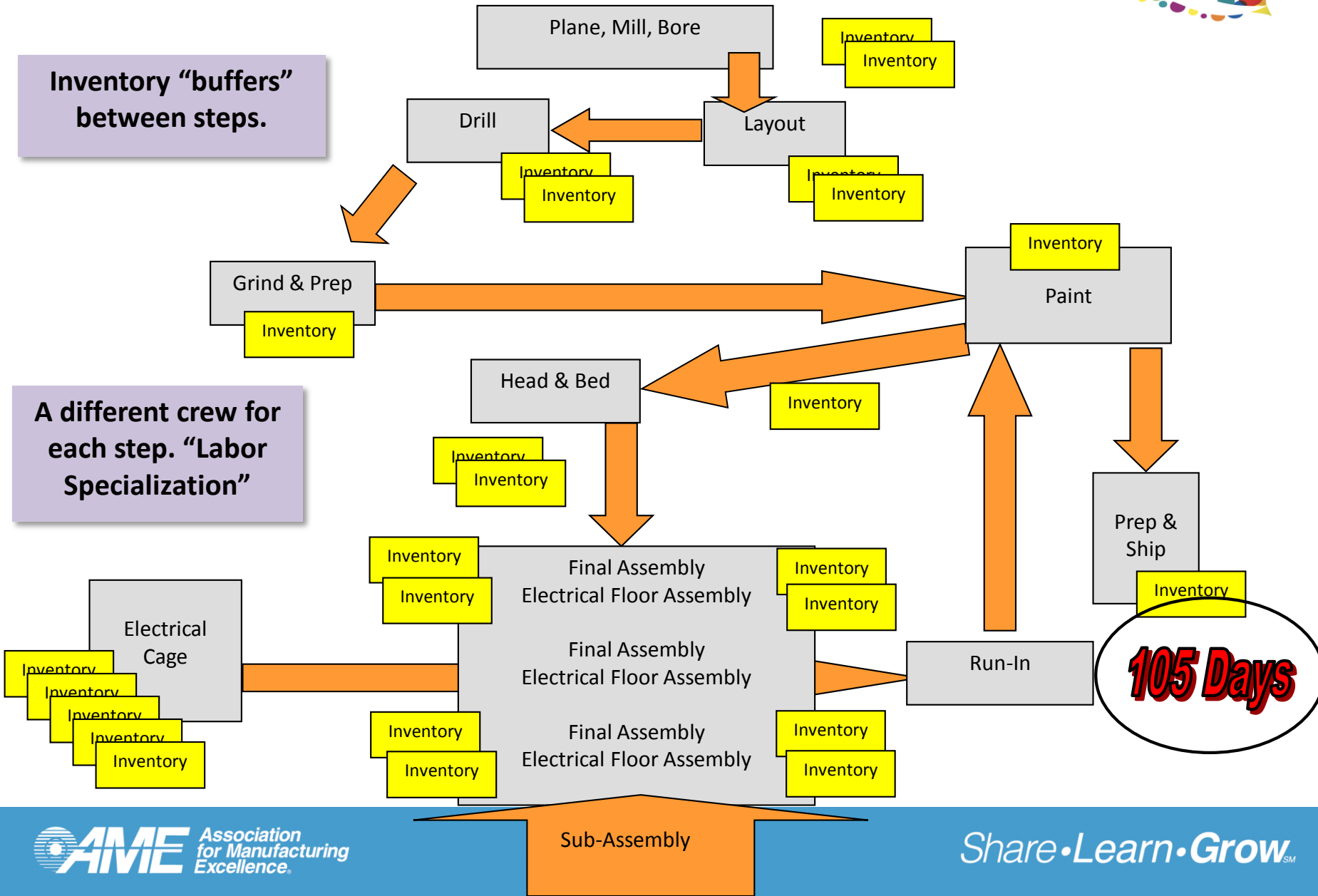
Results: Cycle-time reduced by 80% with 30% fewer people.



# Cellular Manufacturing

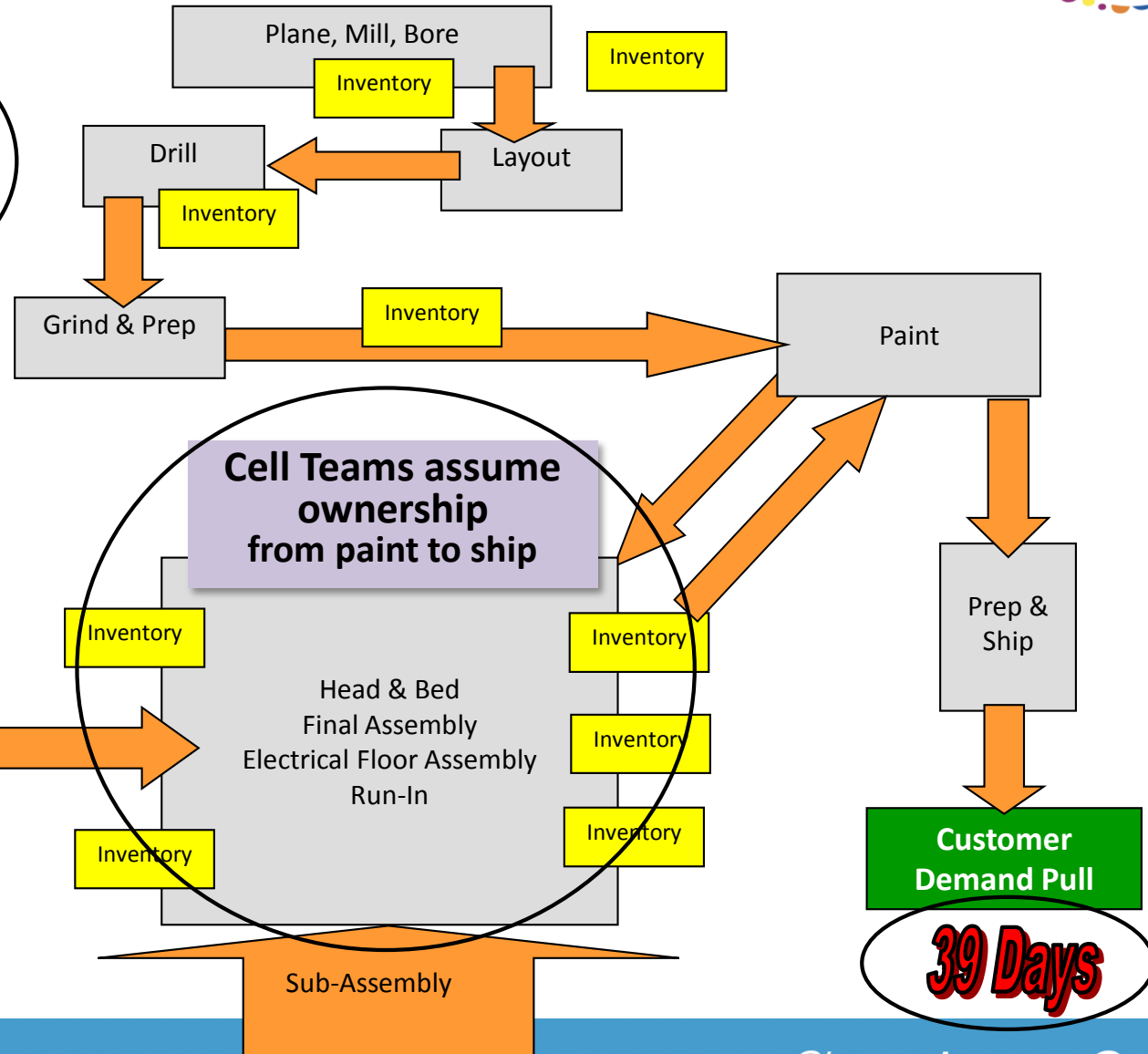
- Cells are created when a value stream is divided into work-centers that **combine as much of the manufacturing process as possible**.
- The objective is to allow a **single work team** to build a complete product - **from start to finish**.
- An ideal cell is **self-contained** with all necessary equipment and resources.
- **Communication is easier** since every operator is close to the others. This improves quality, coordination and support.
- **Simplicity** is an underlying theme throughout cellular design, including material flow. Scheduling, supervision and many other elements also reflect this underlying simplicity.

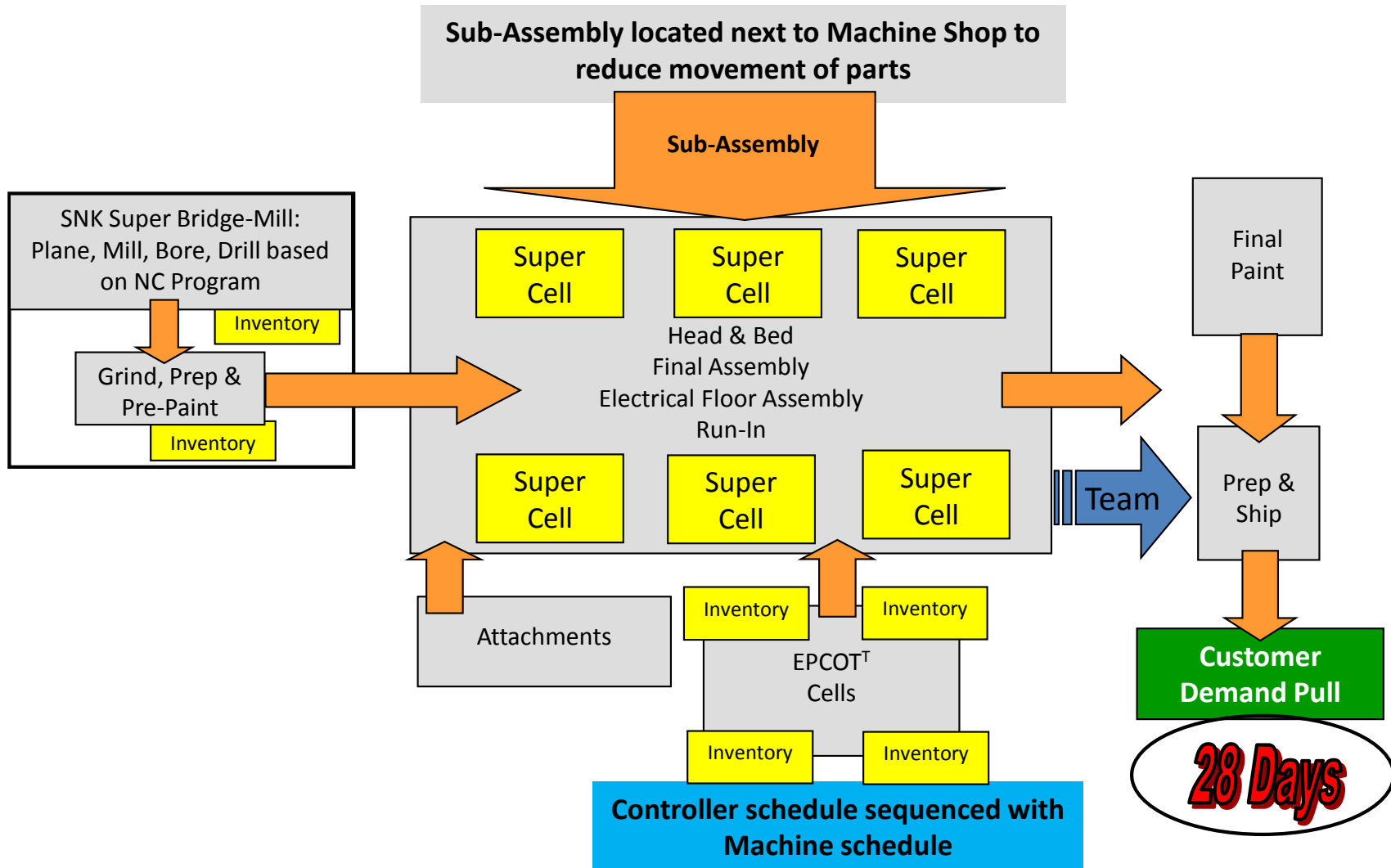






**Inventory is reduced through Pull System**



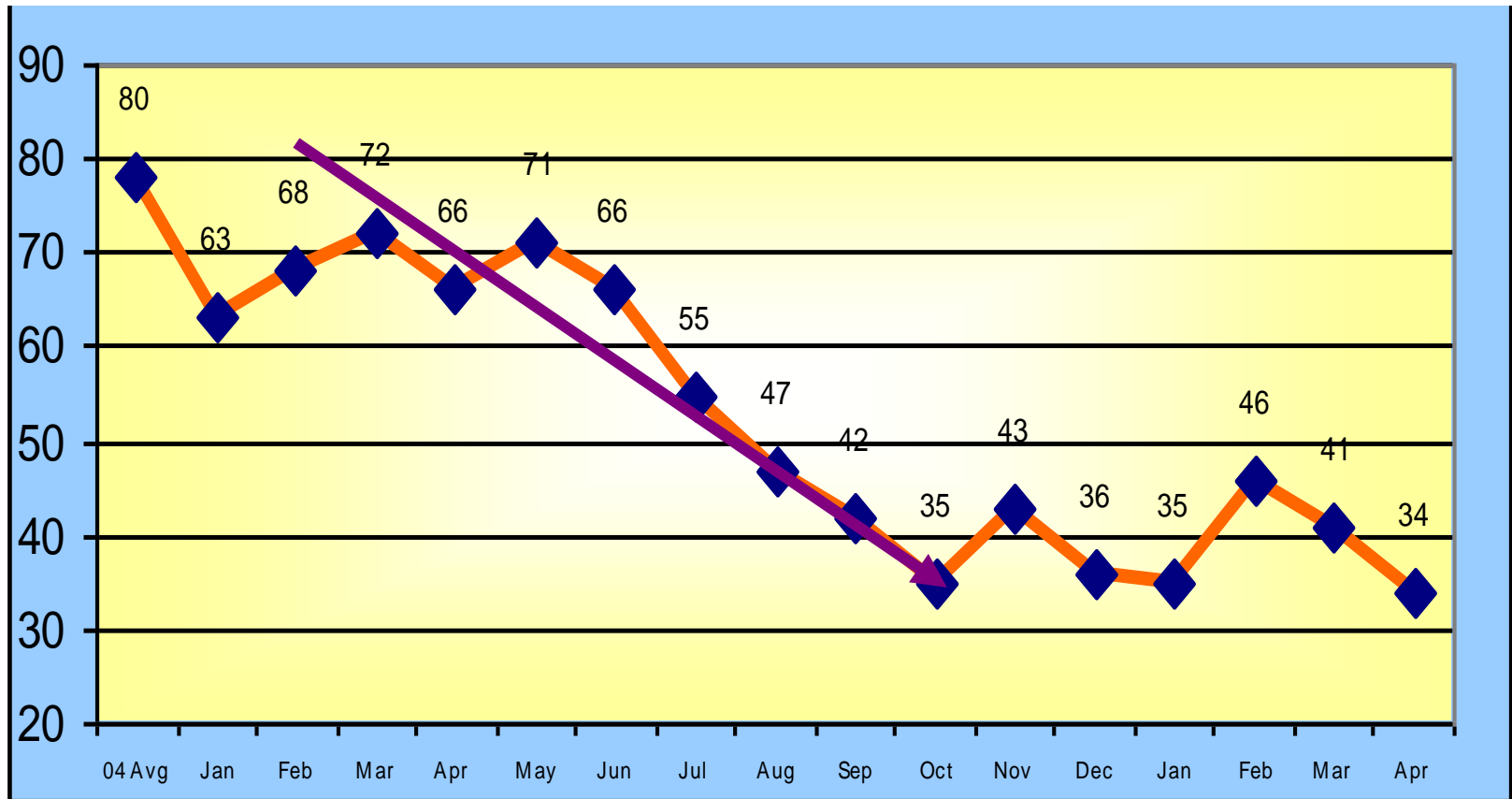








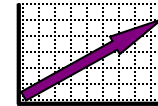
## Machine Build Cycle Time as Cellular Implemented





# Lean Objectives

- On-time delivery of new machines: **Up 400%**
- Manufacturing Cycle time: **Reduced by 65%**
- Growth (production value of shipments): **Consistently up**
- Productivity (Output per employee): **Avg. +15%**
- WIP: **Cut by 70%** (Smaller Lots – Synchronous Flow – Demand Pull System)
- Total Inventory turns: **Doubled**
- Nonconformance: **Reduced 25%**
- Service parts shipped on time (by request): **Up from 70% to 88%**
- Set-Up reduction: **Down by 99%** on some machines
- CNC machine utilization: **Up from <50% to >95%** on some machines
- Installation time: **Reduced by 33%**





# Handrail Cell Project Metrics

## Before Metrics

- Cycle Time = 1.52 days (avg.)
- Rework = 1.1 hrs. / week
- Floor Space = 1387 sq. ft.
- Travel Distance = 1700 ft.
- # of process activities = 54
- Operators = 1

## After Metrics

- Cycle Time = 1.2 hrs. (avg.)
- Rework = 0.1 hrs. / week
- Floor Space = 1159 sq. ft.
- Travel Distance = 92 ft.
- # of process activities = 24
- Operators = 1

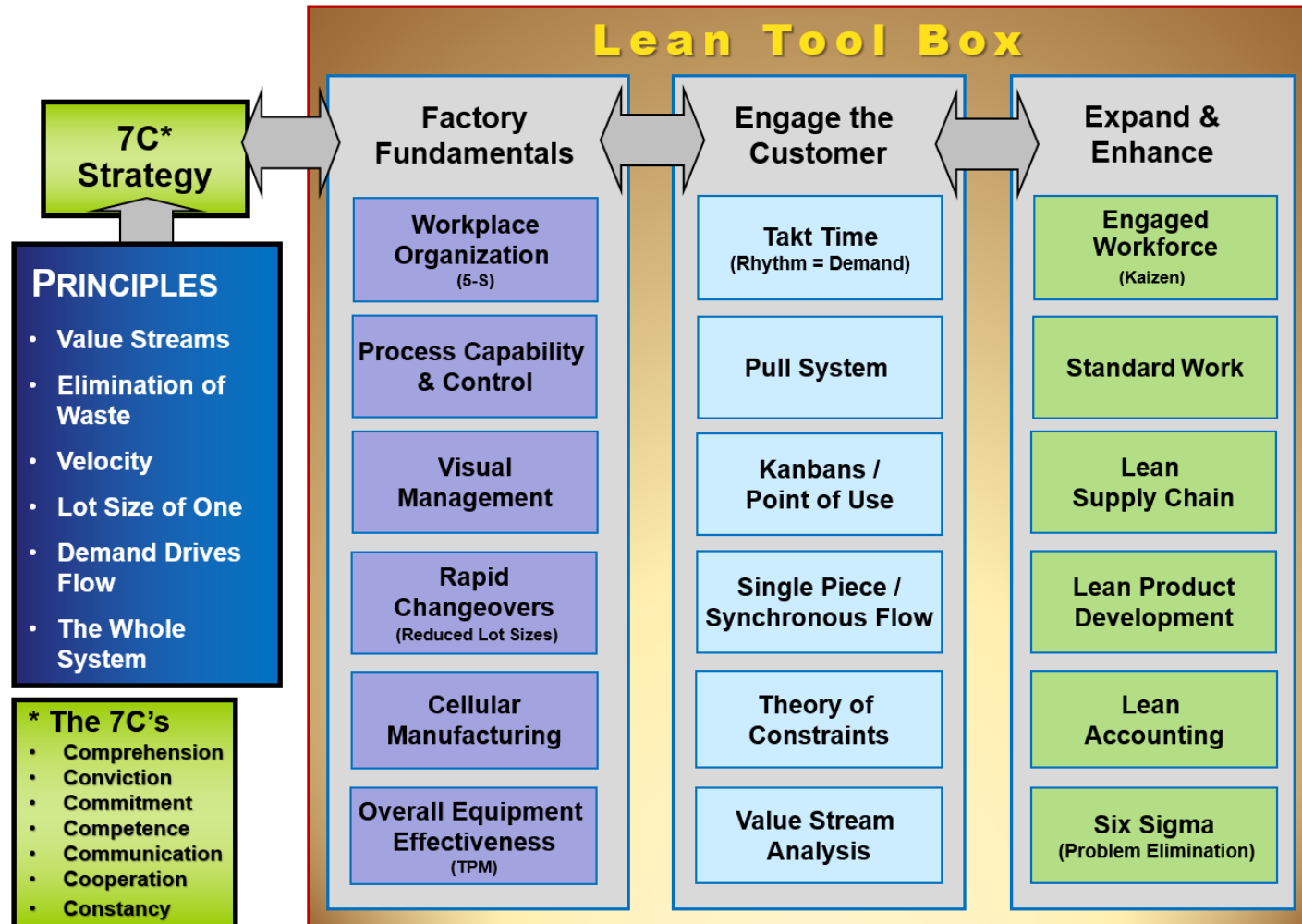


# A Cellular Approach will...

- Eliminate “transition dead time” (fewer hand-offs)
- Reduce motion (machine & crew moves less)
- Make work easier (no forced sequence)
- Make work faster (better assembly sequence)
- Make work safer (fewer ladders)
- Enhance ownership (expands responsibility)
- Improve communication (better teamwork)
- Reduce work-in-process inventory (one at a time)
- Speed product to the customer (shorter cycle times)



# Create Waves of Excellence





# Thank You!

*Your opinion is important to us!*

**Please take a moment to complete the survey  
using the conference mobile app.**

**Session No: ThS/39**

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