

LEAN Introduction

DIZANI

Consulting

Module Objectives

- **Understand the agenda for the week's topics**
- **Learn LEAN Principles**

LEAN Training Modules

Introduction to LEAN	Performance Measurement	5S	Waste
Visual Management	Problem Solving Tools	SMED	Define Value
Value Stream Mapping	Design the System Overview	Process Mapping	Flow
Pull	TPM	Built in Quality	Strive for Perfection

How Class Will Be Run

➤ Highly Interactive

- Lots of exercises, activities and discussions

➤ Materials

- PowerPoint slides
- Textbook
- Worksheets and Templates available

➤ Roles and Responsibilities

- Instructor guides you through the materials and adds experience and examples
- Students are actively engaged in the learning process

Remember, “The One Who Is Doing The Talking Is Doing The Learning,” So Please Participate!

Ground Rules

Proposed Ground Rules:

- Participate
- Respect each other etc
- Turn cell phones to mute
- No Email!
- Return from breaks on time



End of Course Overview



LEAN TRAINING



Module Objectives

- Understand the history of LEAN
- Identify the principles of LEAN
- Describe the LEAN Roadmap
- Explain the benefits and obstacles of LEAN



LEAN Introduction

Class Activity
LEAN Philosophy
LEAN Deployment
LEAN Roadmap
Benefits and Obstacles to Lean
Video
Summary
Quiz

➤ Instructions

- **The tennis ball must touch every person's hand as it completes a full cycle**
- **Tennis ball must start and stop at the same location each round**
- **Participants evaluate ways of improving cycle time and reducing waste**

Exercise

Tennis Ball Challenge

Discussion



Tennis Ball Challenge: Lessons Learned

- We can only act on what we know
- We can always improve our processes further
- Always strive to identify and eliminate waste
- Look at processes end to end
- Continuous small improvements is not enough
- Processes must have sight of customer
- Do not make any assumptions
- Benchmarking introduces another dimension, creates a favorable mental environment to raise the level of thinking substantially

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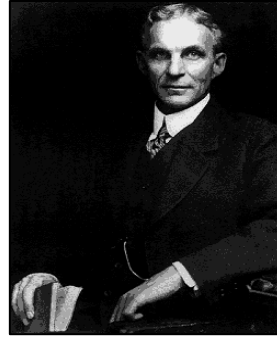
The LEAN Timeline

Interchangeable
Parts



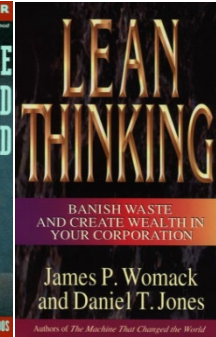
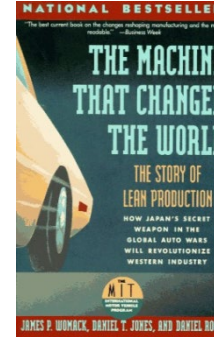
Eli Whitney
1799

Moving
Assembly Lines



Henry Ford
1910

LEAN



Womack & Jones
1991-Present

Standardized
Work



1900
Frederick Taylor

TPS, JIT, World
Class Manufacturing



1950-80
Taiichi Ohno

Next
Step?

LEAN Doctrines

- **Toyota Production System (TPS) – Taichi Ohno learned all he needed to know from:**



Ford Motor Company
River Rouge Plant



American Supermarkets



Indy Car Racing

LEAN Definition

- **The AIM of LEAN Production is to eliminate waste in every area including:**
 - **Customer relations**
 - **Product design**
 - **Supplier networks**
 - **And factory management**

- **Its GOAL is to incorporate:**
 - **Less human effort**
 - **Less inventory**
 - **Less time to develop products**
 - **And less space to become highly responsive to customer demand while producing top quality products in the most efficient and economical manner possible**

Fundamentals of LEAN

Zero Waiting Time

Zero Excess Inventory

Scheduling – Internal Customer

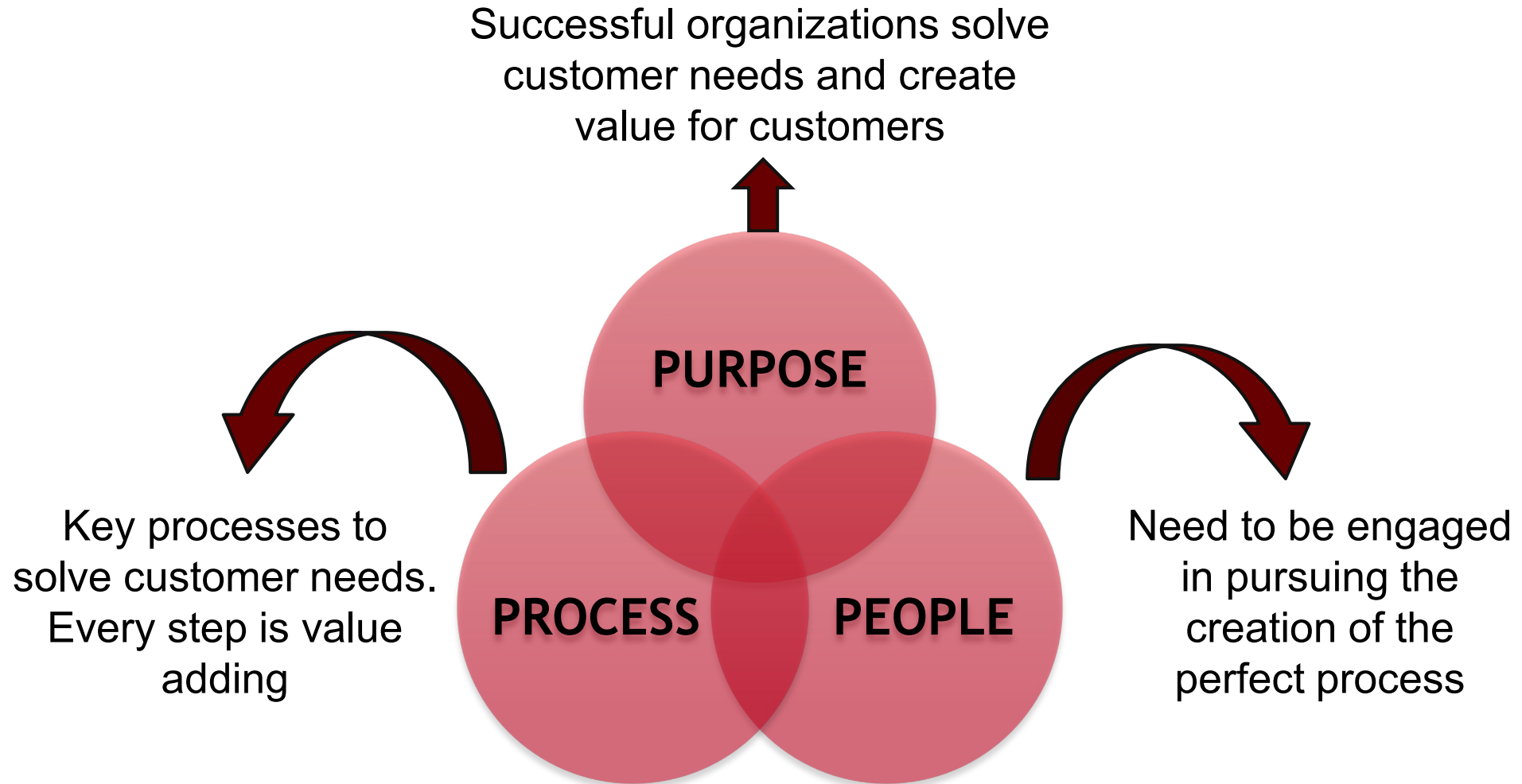
Pull Instead of Push Systems

Batch to Flow – Cut Batch Sizes

Line Balancing

Cut Actual Process Times

Keys to LEAN Philosophy



Created by Dr. James Womack is a Research Professor at MIT and the Founder and Chairman of the LEAN Enterprise Institute – US and Professor Daniel T. Jones is the Founder and Chairman of the Lean Enterprise Academy - UK. They are credited with making LEAN concepts popular in the USA and the Western World

LEAN Philosophy



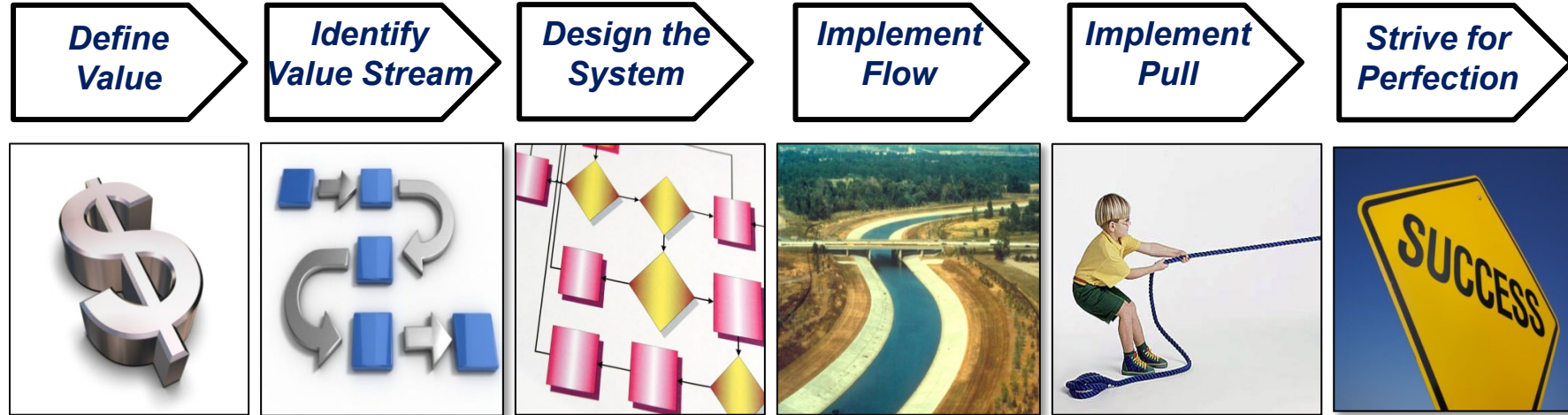
Best Time To Plant a Tree.....25 years ago



**Second Best Time To Plant a Tree.....
Now
-Chinese Proverb**

LEAN Principles

Principles Of LEAN



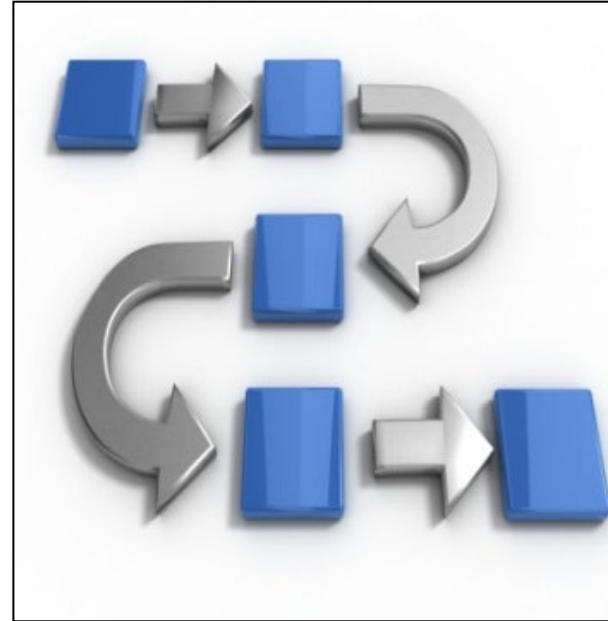
LEAN Principles: Define the Value

- **Select initial scope**
- **Define customer needs**
- **Define VALUE (Quality, Schedule, and Target Cost)**



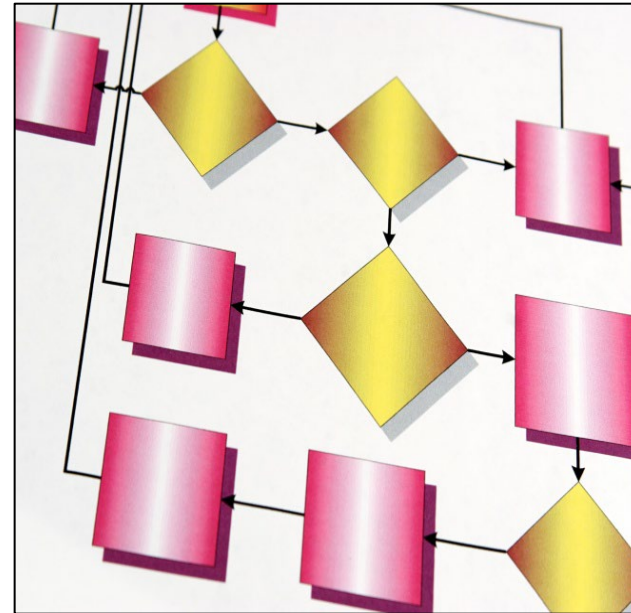
LEAN Principles: Identify the Value Stream

- **Map current state Value Stream**
- **Quantify value and identify opportunities**
- **Chart product and information flow**
- **Collect baseline data**



LEAN Principles: Design Production Systems

- **Develop the future state Value stream map**
- **Plan new layout**
- **Design visual control system**
- **Review make or buy decisions**



LEAN Principles: Implement Flow

- Identify new Takt
- Standardize work
- Mistake proof processes
- Achieve process control
- Implement self inspection
- Cross train workforce
- Reduce set up times
- Implement visual controls



LEAN Principles: Implement Pull

- **Implement the new process**
- **Establish Pull**
- **Establish Kanbans**
- **Strive for single item flow**
- **Draw down inventories**
- **Reassign people**
- **Link with suppliers**



LEAN Principles: Strive for Perfection

- Team development
- Optimize quality
- Institutionalize 5s
- Institute Kaizen events
- Remove system barriers
- Expand TPM
- Mistake proofing process
- Performance Measurement



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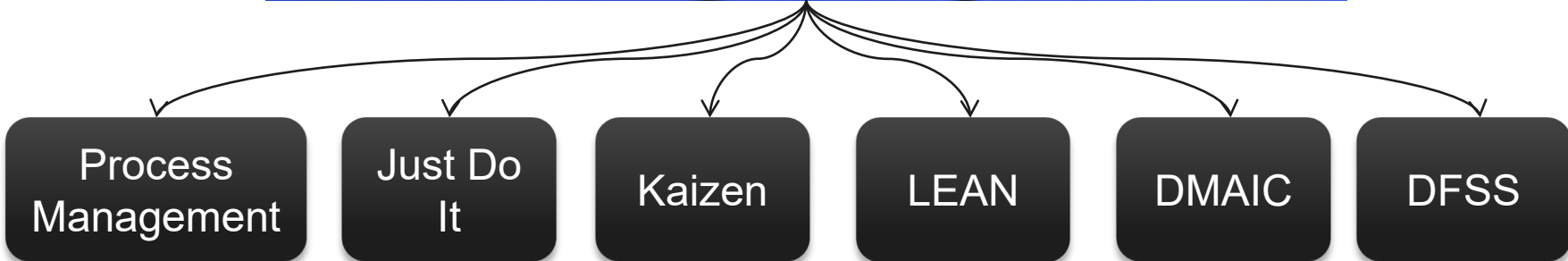
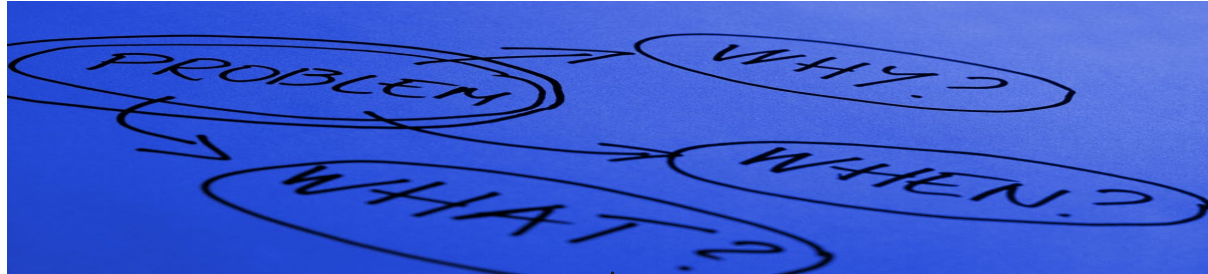
Benefits and Obstacles to Lean

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Types of Improvement Methodologies



- Process performance is unknown or not understood
- Implement a process monitoring dashboard to decide what to do next

- Problem identified and solution is known
- Implement a fix and establish a dashboard to continuously monitor process

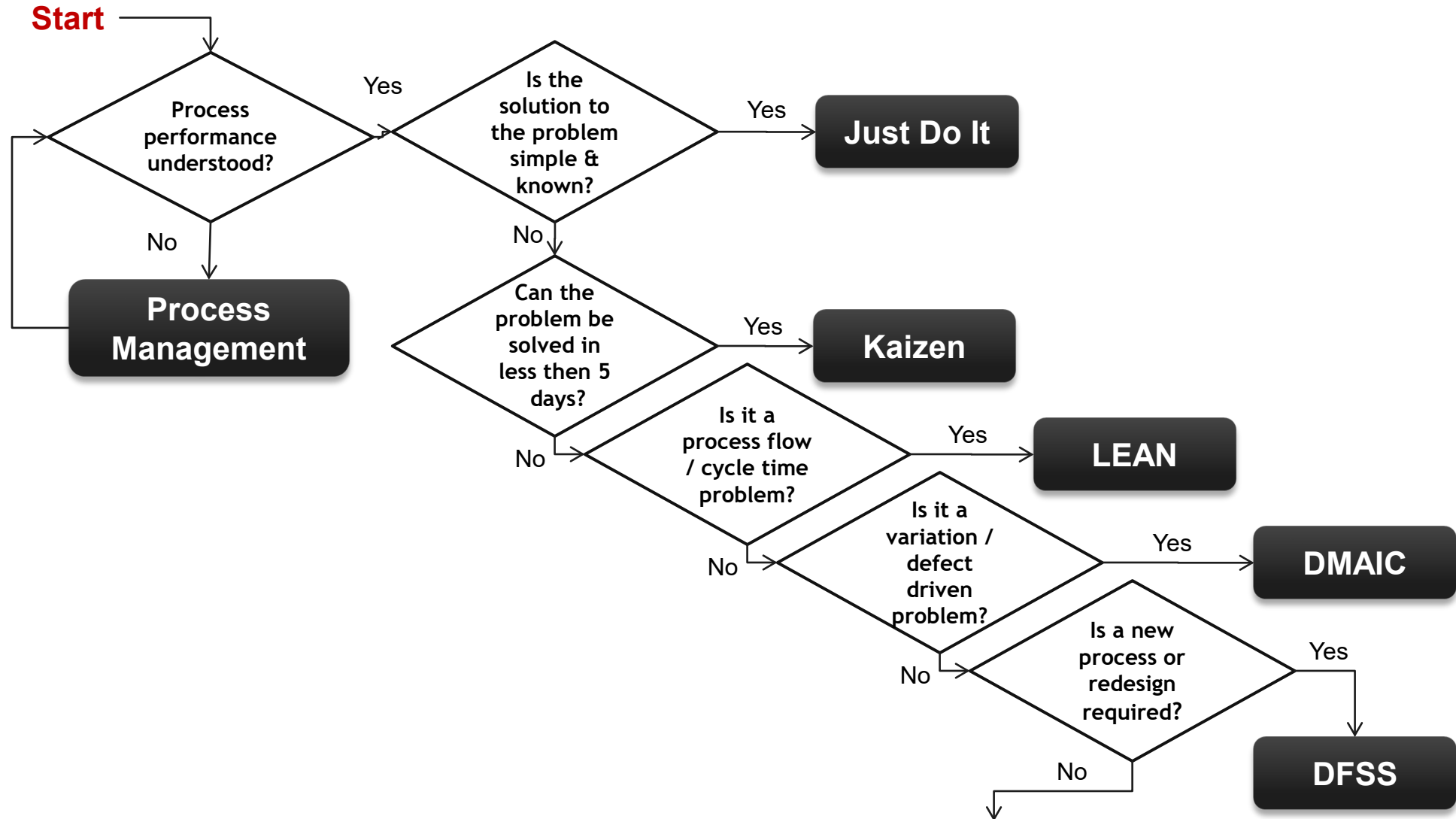
- Problem identified and solution is unknown.
- Small in scale or urgency needed for process improvement
- Initiate 2-5 day Kaizen Event to analyze the process and implement improvements

- Process is inefficient and contains wasteful activities
- Initiate a project to identify non value-add activities and remove waste from the process

- Existing process is not meeting customer requirements or business objectives
- Initiate a project to identify root causes of process and initiate breakthrough improvements

- New process or an existing process that needs to be designed
- Initiate project to design processes to meet customer requirements

Methodology Decision Tree



Explore Other Methodologies

LEAN Deployment vs. LEAN Project

Enterprise Wide Deployment (Planting A Forest)

SCOPE

18 months - 2 years + depending on the size of the company
LEAN the whole Value Stream

LEADERSHIP

Driven from the Top down
Organization Wide Reach

RESULTS

Changes the business processes completely
Huge efficiencies across the Value Stream

Project (Planting One Tree)

SCOPE

1 week - 6 months
LEAN a section or part of a process

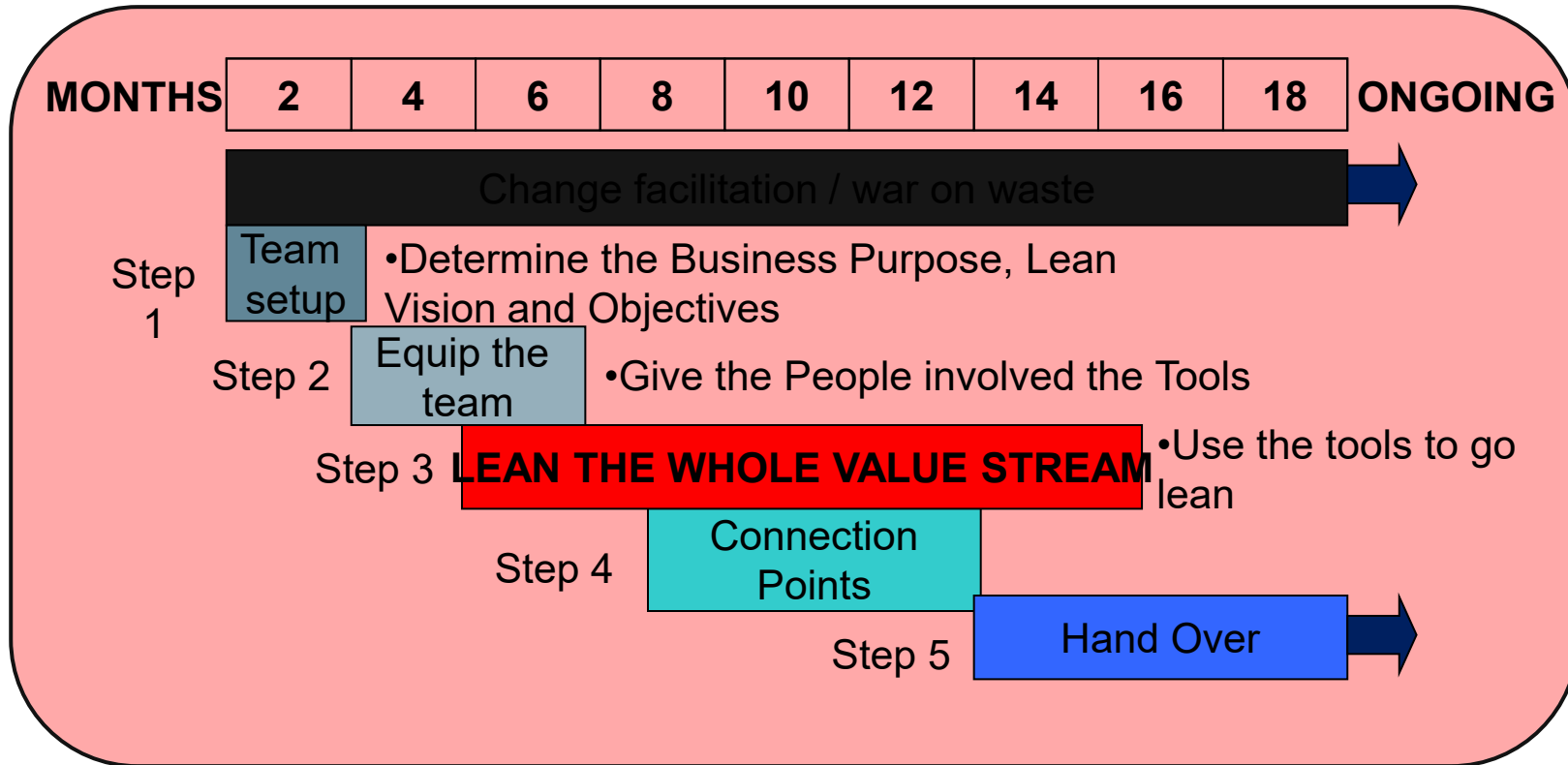
LEADERSHIP

Sponsor Initiated
Project Manager Driven

RESULTS

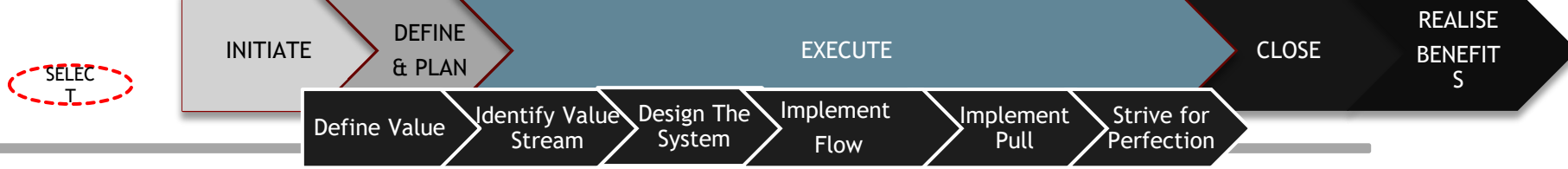
Small, focused results

Example of LEAN Deployment Time



- **Organization wide Goal**
- **Driven from the Top**
- **Aligned to the Company Strategy**

LEAN Project



Project Mgt Deliverables

<ul style="list-style-type: none"> • Business Case • Change Assessment • Go/No Go Decision 	<ul style="list-style-type: none"> • Charter • Stakeholder Analysis & Change management Plan • Updated Business Case • Go/No Go Decision 	<ul style="list-style-type: none"> • Updated Project Dashboard • Updated Risk Log • Updated Issue Log • Change Requests • Updated Change Control Log • Updated Project Contract • Updated Business Case • Updated Stakeholder Analysis • Updated Change Management Plan • Expanded Project Plan for Implementation and Training (incl. CM controls) 				<ul style="list-style-type: none"> • Final Project Report • (Handover Plan includes Change Management Controls) Sponsor Acceptance • Lessons learned 	<ul style="list-style-type: none"> • Business Benefits Realisation Status Report • Change Status) • Sign-off of Business Benefits Achieved
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LEAN Sub Processes Steps

<ul style="list-style-type: none"> • Select initial scope • Define customer needs • Define value • Identify Waste • Implement 5S 	<ul style="list-style-type: none"> • Develop the current state Value stream map • Chart product and information flow • Collect baseline data 	<ul style="list-style-type: none"> • Develop the future state Value stream map • Review make/buy decisions • Plan new layout • Design visual control system • Estimate and justify costs 	<ul style="list-style-type: none"> • Identify new Takt • Standardize work • Achieve process control • Implement self inspection • Eliminate waste • Cross train workforce • Reduce set up times 	<ul style="list-style-type: none"> • Establish Kanbans • Implement the new process • Establish Pull • Strive for single item flow • Draw down inventories • Reassign people 	<ul style="list-style-type: none"> • Team development • Optimize quality • Institutionalize 5s • Institute Kaizen events • Remove system barriers • Expand TPM • Mistake proof processes 	Performance Measurement
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LEAN Specialist Deliverables

<ul style="list-style-type: none"> • Lean Assessment • Customer needs identified • Identified Value & Waste • 5S 	<ul style="list-style-type: none"> • Value Stream Map 	<ul style="list-style-type: none"> • Future Value Stream Map 	<ul style="list-style-type: none"> • New Takt • Standardized work • Single piece flow • Inventory Management • Visual Controls 	<ul style="list-style-type: none"> • New layout • Visual control system • Kanban* 		
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What do we want to do?



Remove waste: Not just refuse and rubbish but clean our processes so that we operate quickly and efficiently. In effect we declare a “war on waste”



Develop staff: Enable you to uplift yourselves and the organization



Set up teams: Solve problems at the level at which they occur



Train all employees: Give you the skills to apply the best available techniques



Implement projects: Identify and implement improvement projects across all areas of the company

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ROADMAP TO LEAN

Supply Chain/External Environment

Enterprise/ System Interface

- Financial
- Information

- Procurement
- Engineering

- Quality
- Safety

- Training and Human Resources
- Workforce/Management Partnership

Phase 0 Adopt Lean Paradigm

- Build vision
- Establish need
- Foster lean learning
- Make the commitment
- Obtain senior management buy-in

Top Leadership
Commitment

Phase 1 Prepare

- Integrate with Enterprise Level
- Establish an operations lean implementation team's)
- Develop implementation strategy
- Develop a plan to address workforce changes
- Address site specific cultural issues
- Train key people
- Establish target objectives (metrics)

Lean Roadmap

Phase 2 Define Value

- Select initial scope
- Define customer needs
- Define value



Phase 3 Identify Value Stream

- Develop the current state Value stream map
- Chart product and information flow
- Collect baseline data



Phase 4 Design the System

- Develop the future state Value stream map
- Review make/buy decisions
- Plan new layout
- Design visual control system
- Estimate and justify costs



Phase 5 Implement Flow

- Identify new Takt
- Standardize work
- Achieve process control
- Implement self inspection
- Eliminate waste
- Cross train workforce
- Reduce set up times



Phase 6 Implement Pull

- Establish Kanbans
- Implement the new process
- Establish Pull
- Strive for single item flow
- Draw down inventories
- Reassign people



Phase 7

Strive for Perfection

- Team development
- Optimize quality

- Institutionalize 5s
- Institute Kaizen events
- Remove system barriers

- Expand TPM
- Mistake proof processes

- Performance Measurement

ENTRY

Expand Internally / Externally

IMPROVED COMPETITIVE POSITION

LEAN Roadmap - Phase 0 and 1

Phase 0: Adopt a LEAN Paradigm

- Build vision
- Establish need
- Foster lean learning
- Make the commitment
- Obtain senior management



Phase 1: Prepare

- Integrate with Enterprise Level
- Establish an operations lean implementation team's)
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Benefits of LEAN

Benefits In Factory Operations

Improvement In Responsiveness To Customers

Factory Floor chaos is eliminated

Labor productivity is doubled or tripled

Production control and information flows are greatly simplified

Inventory levels at all stages are dramatically lowered

Benefits Beyond Production Operations

“Voice of the customer” becomes primary driving force in the enterprise

New product development time is greatly reduced

Relationships with suppliers have been revolutionized

Responsiveness to changing market conditions is enhanced

Organizational structure shifts from Vertical (Hierarchical) to Horizontal

Benefits of LEAN

Type Of Benefit	Initial LEAN Conversion	Continuous Improvement
➤ Labor Productivity	Double	Double Again
➤ Production Throughput Times	90% Reduction	50% Reduction
➤ Inventories (Throughout)	90% Reduction	50% Reduction
➤ Errors Reaching Customers	50% Reduction	50% Reduction
➤ Scrap	50% Reduction	50% Reduction
➤ Time To Market, New Product	50% Reduction	50% Reduction

Obstacles to LEAN

Awareness and Understanding of LEAN:

Some concepts are counter-intuitive, that is, dramatically opposed to traditional wisdom

Deeply Engrained Mass Production Mentality:

Long production runs of standardized parts in batches and flow times, high levels of inventory, crowded factory floors etc.

Management Resistance:

With LEAN there is a perceived loss of power, prestige and authority. LEAN's team-based management concept is threatening

Employee (Esp. Union) Concern:

Job security may be threatened, Employees fear work intensification and unlimited demands for performance

Quotes from one of Toyota's Greatest Leaders

“We shall learn production techniques from the American method of mass production. But, we will not copy it as it is. We shall use our own research and creativity to develop a production method that fits our own country's situation.”

-Toyoda Kiichiro

(Son of Toyoda Sakichi's - Founder of the Toyota Motor Corporation)

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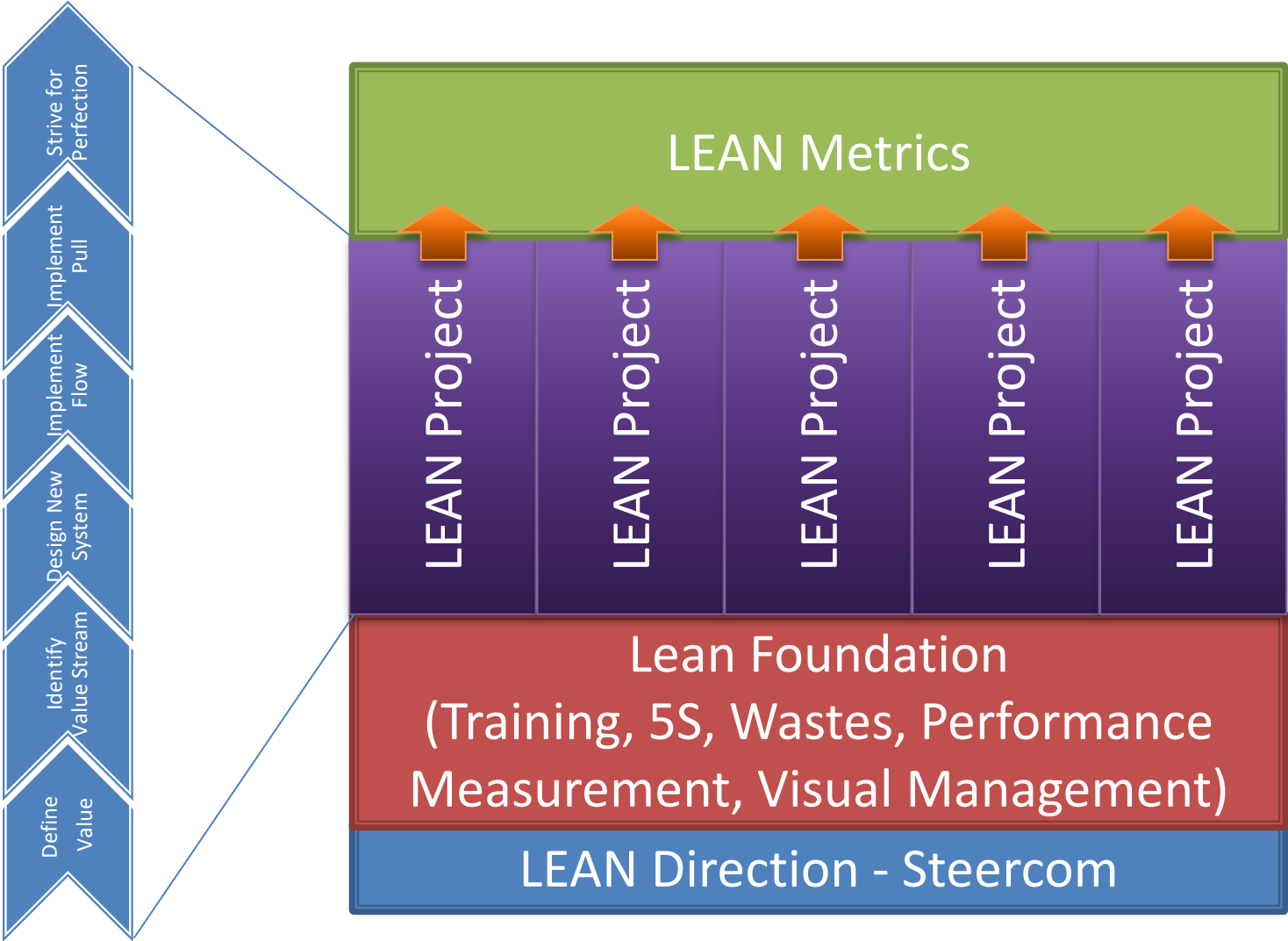
Quiz

LEAN Introduction Summary

➤ What you learned during this section:

- Understand the history of LEAN
- Identify the principles of LEAN
- Describe the LEAN Roadmap
- Explain the benefits and obstacles of LEAN

Dizani Lean Model



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Quiz

- Who was the father of modern assembly lines which lead to LEAN thinking?
- What did Taiichi Ohno see in the USA that taught him about the principles of Flow?
- What did he see that taught him the principles of Pull?
- What did he see that taught about Quick Change Over?
- What are the principles of Lean?
- What are the key differences between running a Lean deployment and a Lean Project?
- Define 3 benefits and obstacles of Lean?
- Name the key roles utilized in a Lean Project?



Dizani – Your Partner in Productivity!

Thank You

