



***Sustaining Lean in
Pathology and Laboratory Medicine
Across the Health System:
Lessons from Year 6 of
The Henry Ford Production System***

“Quality is doing it right when no one is looking.” -Henry Ford

Richard J Zarbo MD, Pathology & Laboratory Medicine, Henry Ford Health System, Detroit

LESSONS

Lesson #1

It takes systems to integrate systems

Lesson #2

Systems don't produce quality, people do!

The Henry Ford Production System

- * Henry Ford's Vision
- * Deming's management
- * Toyota's worker empowered continuous improvement culture

Henry Ford Production System

Management System

Henry Ford Production System

Toyota in the House of Ford



Henry Ford Production System

Toyota Culture



"The process improvement tools and techniques, while important, are not the key for successfully transitioning from conventional manufacturing to LEAN manufacturing.

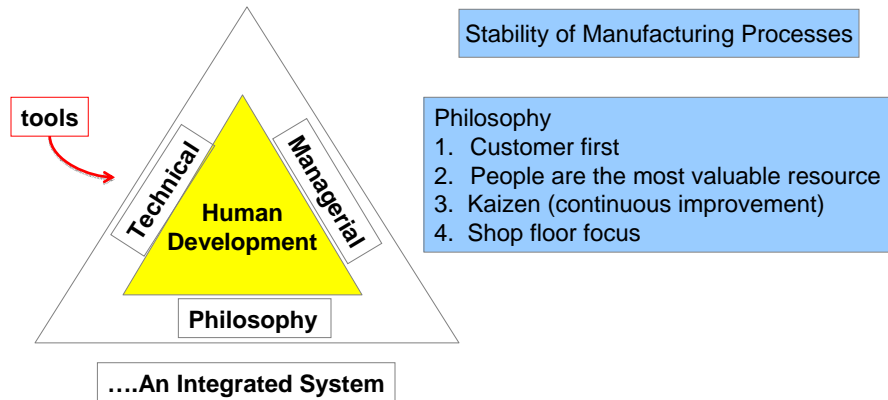
The key is the culture –
that supports and stimulates continuous growth and improvement."

(J. Womack)

Henry Ford Production System

Organizational Culture

Toyota Production System



Henry Ford Production System

LEAN =
Deming
(perfected by)



Henry Ford Production System



Deming Management

Quality focus- customer requirements

Quality control

Measurement (Shewhart-Deming cycle PDCA)

Knowledge of variation, process stability

Value of worker, PDCA at worker level

New focus and role of the leader/manager

Continuous improvement

Long term plan

Henry Ford Production System

DEMING'S
14 POINTS
*CREATE
CULTURE*

Henry Ford Production System

Deming's Way

14 Points for Management

1. Create constancy of purpose for improvement-customer focus
2. Adopt the new philosophy
3. Cease dependence on mass production
4. End the practice of awarding business on price alone
5. Constantly & forever improve systems of production & services
6. Institute modern methods of training on the job
7. Institute modern methods of supervision & leadership
8. Drive out fear
9. Break down barriers between departments
10. Eliminate numerical goals for workforce
11. Eliminate work standards & numerical quotas
12. Remove barriers to pride of workmanship
13. Institute a vigorous program of education & training for everyone
14. Create a structure in top management that will push every day on the above 13 points

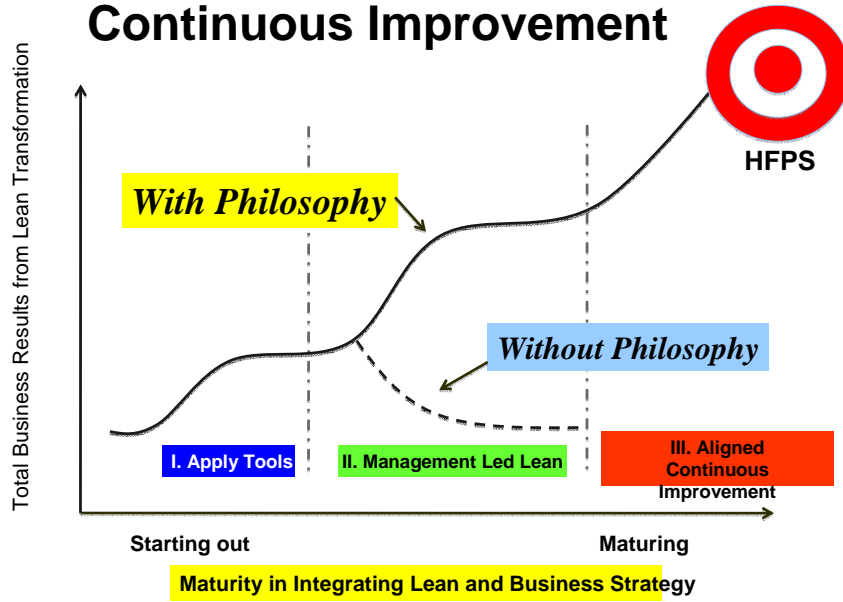
W E Deming *Out of the Crisis*, 1982

Henry Ford Production System

LEAN =
Management
System

Henry Ford Production System

Results as Lean Evolves to Aligned Continuous Improvement



From *The Toyota Way to Continuous Improvement* by Liker & Franz

Philosophy

Philosophy That Promotes People

HENRY FORD PRODUCTION SYSTEM



One Vision, Mission, Values

HENRY FORD PRODUCTION SYSTEM

- **Best in Class**
 - Every Life Deserves World-Class Laboratory Service
- **Culture of continuous improvement**
 - Relentlessly Pursuing Perfection
- **Culture of worker empowerment for change**
 - Never Pass a Defect
- **Deming management principles**
 - Our People Are Our Experts & Most Valuable Asset
- **Lean work rules & principles**
 - Variation and Poor Communication Are Our Enemies

Henry Ford Production System

“Relentlessly Pursuing Perfection”

Delivery of products & services should pursue the Ideal Target

Product or service that is produced

- **Defect Free** (goal is zero, meets customer expectation)
- **On demand** (supplied when you want it, in right version)
- **Delivered immediately** (now, no waiting)
- **One at a time** (single piece flow, batch size of 1)
- **Continuous flow** (no batches, queues)
- **No waste** (materials, labor, energy, other resources)
- **Safely for every employee**
 - Physically, emotionally, professionally

Henry Ford Production System

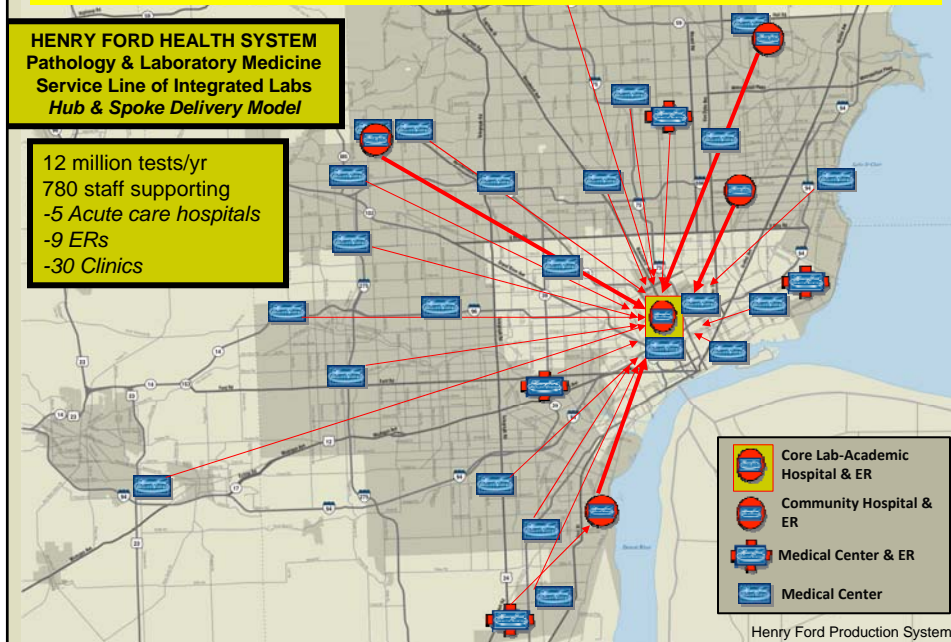
Macro Organizational System

Henry Ford Production System

Disparate Cultures of Henry Ford Labs

HENRY FORD HEALTH SYSTEM
Pathology & Laboratory Medicine
Service Line of Integrated Labs
Hub & Spoke Delivery Model

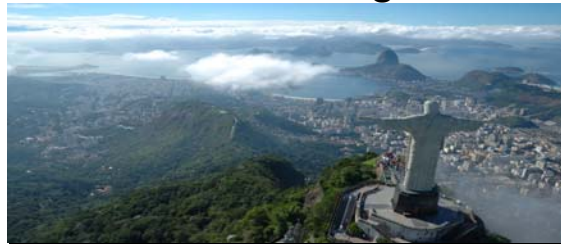
12 million tests/yr
780 staff supporting
-5 Acute care hospitals
-9 ERs
-30 Clinics



Chimneys of Control

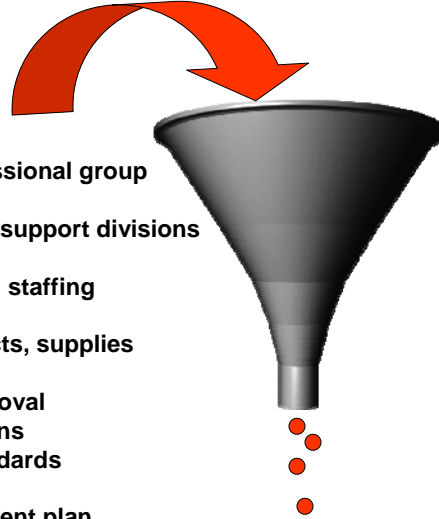


Vertical Management



Integration

- ONE leadership group
- ONE employed professional group
- Information systems
- Technical teams/Core support divisions
- Salary & contracts
- Position management, staffing
- Recruitment
- Test methods, contracts, supplies
- Testing sites
- Capital priority & approval
- Purchase & acquisitions
- Quality & service standards
- Policies & procedures
- ONE quality management plan
- Safety, education & competency



Henry Ford Production System

Horizontal Management

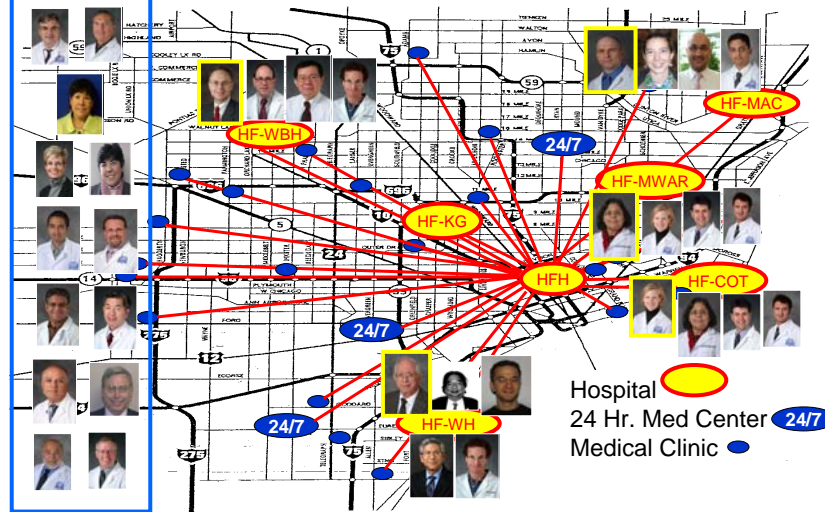
Central Core Labs, Pathology
specialty expertise, oversight
& shared resources



Henry Ford Production System

Dismantling Chimneys

Cloud Cover One Group of 42 Senior Professional Staff



Henry Ford Production System

Quality Management Metrics On-line All Hospitals Trended

TURN-AROUND TIME (TAT)

Emergency Room TAT

CBC, Troponin, Lyte-7, PT, PTT

STAT TEST TAT

Chem, Heme, Coag, Urinalysis

CAP ACCREDITATION REQUIRED

Frozen Section TAT

Surgical Path TAT

Cytology Non-Gyn TAT

Cytology PAP Smear TAT

Blood Culture Contamination

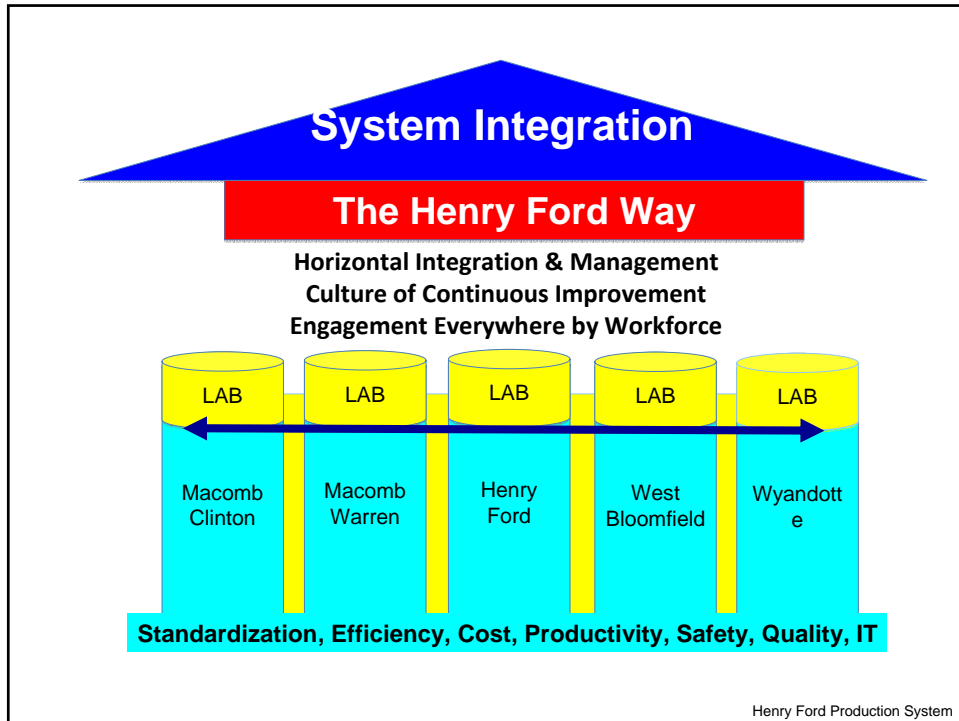
Critical Value Reporting

Customer & Staff Satisfaction

FINANCIAL

Blood/Product Wastage

Henry Ford Production System

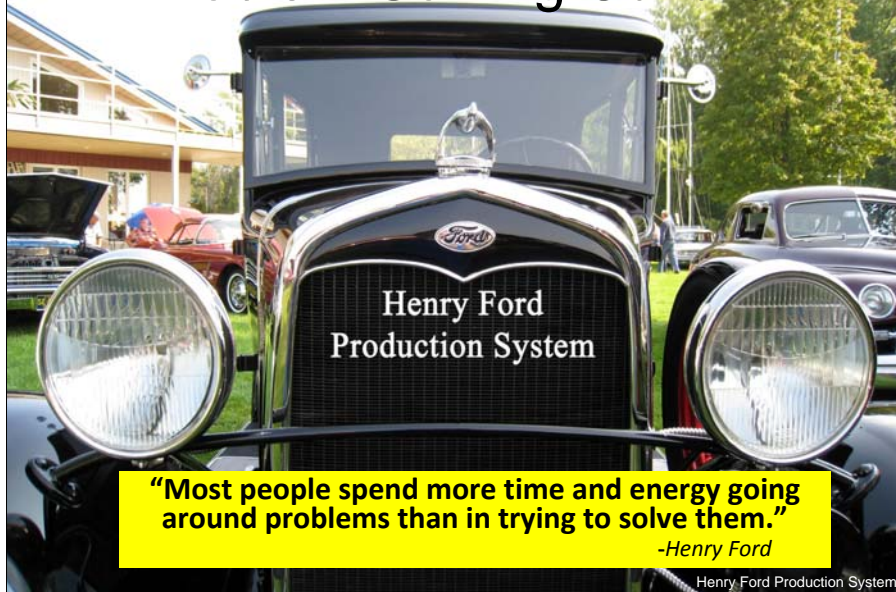


**INTEGRATE ONE
SYSTEM OF
CONTINUOUS
IMPROVEMENT**

Henry Ford Production System

The image features a large blue rectangle with the text 'INTEGRATE ONE SYSTEM OF CONTINUOUS IMPROVEMENT' in white, bold, serif capital letters. The text is centered within the rectangle. In the bottom right corner, the text 'Henry Ford Production System' is written in a smaller, black font.

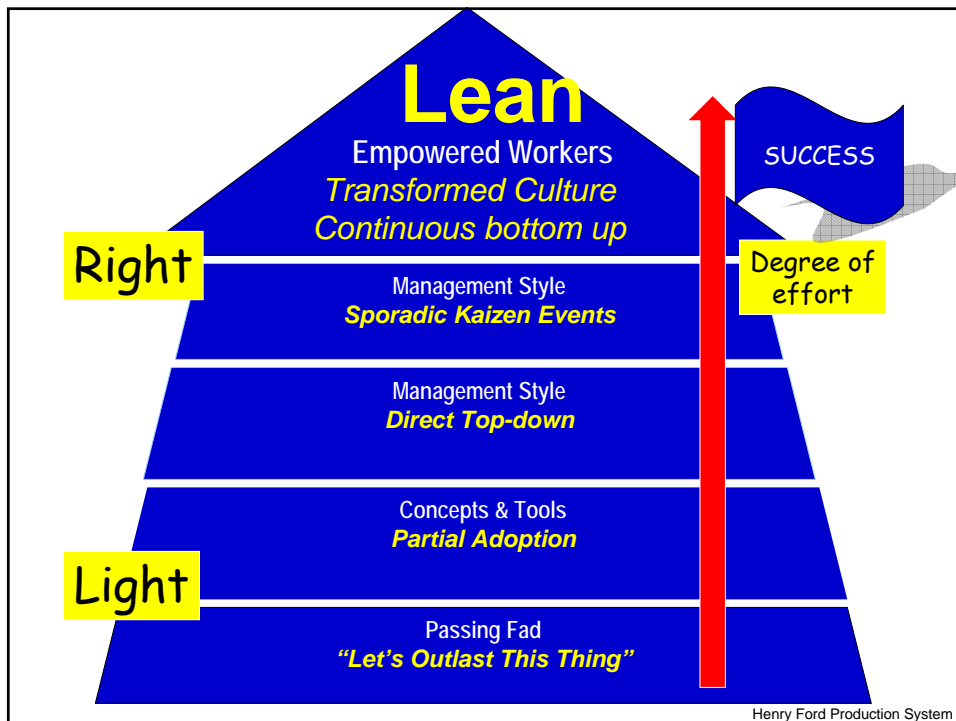
Common, Continuous Problem Solving Culture



"Most people spend more time and energy going around problems than in trying to solve them."

-Henry Ford

Henry Ford Production System



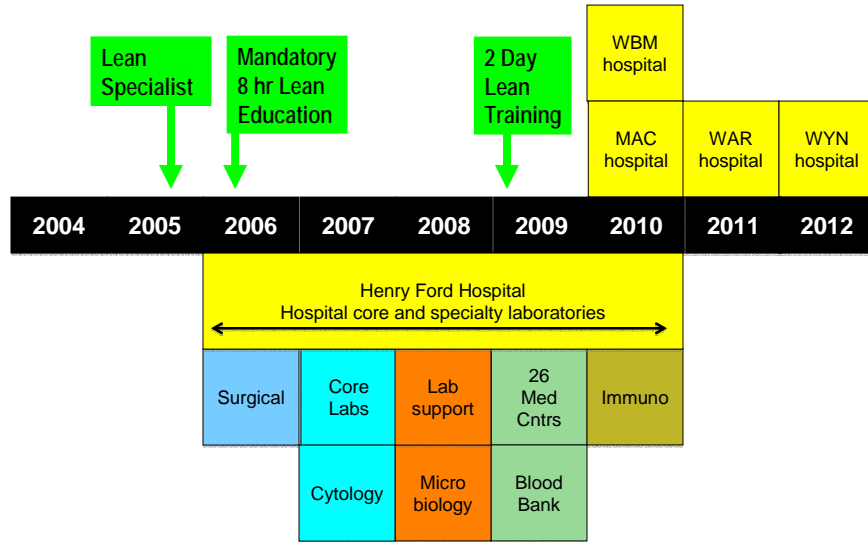
Micro Organizational System

Henry Ford Production System

SPREADING CHANGE

Henry Ford Production System

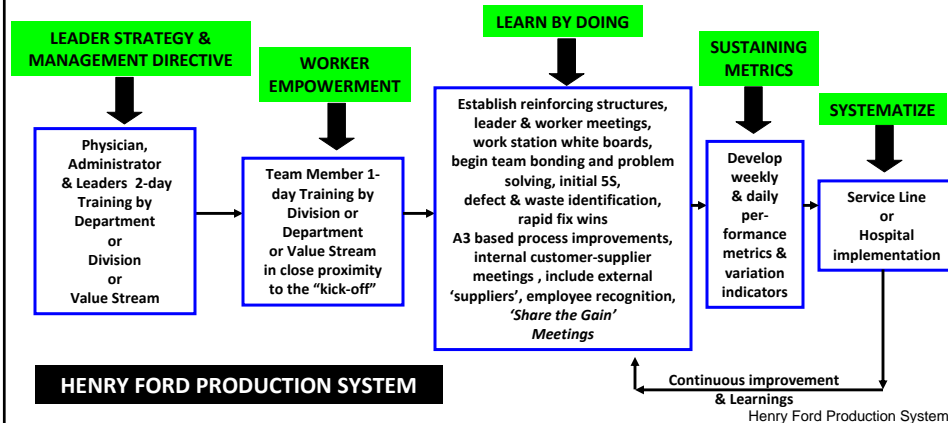
Henry Ford Laboratories 2005-2011 Deep Lean Progression



Henry Ford Production System

Quality Culture "Model Line" Transformation Process

- Define vision, mission, values
- Deming management principles
- Toyota work rules & principles
- Create organizational structure for authorized change
- Identify group & team leaders by workstations
- Align in path of workflow for horizontal management



HENRY FORD PRODUCTION SYSTEM

Henry Ford Production System

EXPECTATION OF MANAGERS

Henry Ford Production System

Deming Culture

Deming's Redefinition of Management

"In companies that have embraced Deming's vision, **management's job is to 'work on the system'** to achieve continual product and process improvement.

The Deming-style manager must-
ensure a system's consistency and reliability, by bringing
level of **variation in its operations within predictable limits**, then by
identifying opportunities for improvement, by
enlisting the **participation of every employee**, and by
giving subordinates the practical benefit of his experience
and the **help they need to chart improvement strategies.**"

(A. Gabor)

Henry Ford Production System

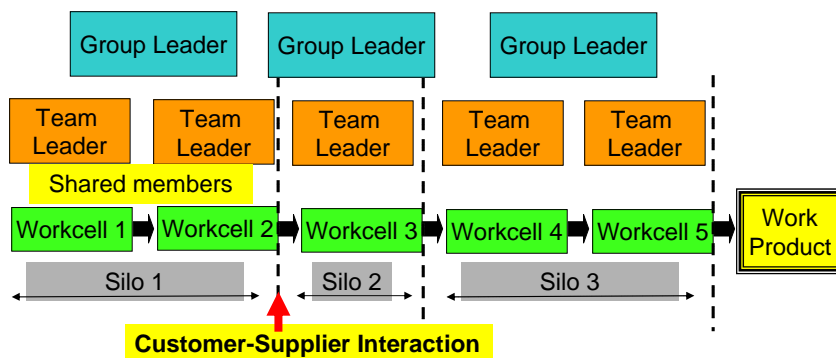
STRUCTURE THAT SUPPORTS PEOPLE

Henry Ford Production System

QUALITY SYSTEM STRUCTURE ORGANIZATION CHART For Worker Driven Continuous Improvement

How is change authorized and made?

Find Your Role



Henry Ford Production System

EXPECTATION OF WORKERS

Henry Ford Production System

Redefine the Expectation of "Work"

***Never Accept, Make or
Pass a Defect***

"It's the work, not the man that manages."

-Henry Ford

Henry Ford Production System

"Most doctors prescribe pills, I prescribe empowerment"
-Jay Parkinson, MD

The Engaged Worker

Transform approach to work

- Not just showing up for work, but arriving to do the work better

Culture

Empowered workers who see their daily work in the context of-

- Continually learning
- Constantly communicating
- Making effective process improvements
- Designed and tested by scientific method

**Empowered Personnel, Correcting One's Own Errors,
Accountable For Solving Problems in Teams & Creating Standard Work**

Henry Ford Production System

**EXPOSE
DEFECTS**

*VISUAL WORKPLACE
BLAMELESS CULTURE*

Henry Ford Production System

Visual Workplace “No Problem is a Problem”

7 Wastes	5 Why's	4 Work Rules	Process	Leader
<p>7 Types of Waste</p> <ul style="list-style-type: none"> Waiting – wasted time between steps Defects – process & product mistakes Transportation – unnecessary movement of material & products Overproduction – more than needed Over-processing – redundant steps, rework Motion – unnecessary movement of people Inventory – over or under stock 	<p>Root Cause</p>	<p>4 Rules of Work Design</p> <ul style="list-style-type: none"> Rule 1 - STANDARD ACTIVITIES Rule 2 - STANDARD CONNECTIONS Rule 3 - STANDARD PATHWAYS Rule 4 - IMPROVEMENT & WORKER ENGAGEMENT 	<p>HFPS Process Improvement Procedure</p>	<p>Wednesday's Words of Quality</p>
<h2>Capture Daily Defects</h2> <ol style="list-style-type: none"> Wrong patient identification Ran out of gloves- size medium Not enough specimen collected for lab test 				
<h2>Daily Resolution of Defects</h2> <p>Rapid (Defects corrected on the spot) A3 (PDCA analysis and customer-supplier involvement)</p>				
<h2>Communication & Education</h2> <p>All shifts (New policy, standard work, hours, competency, quality tool)</p>				

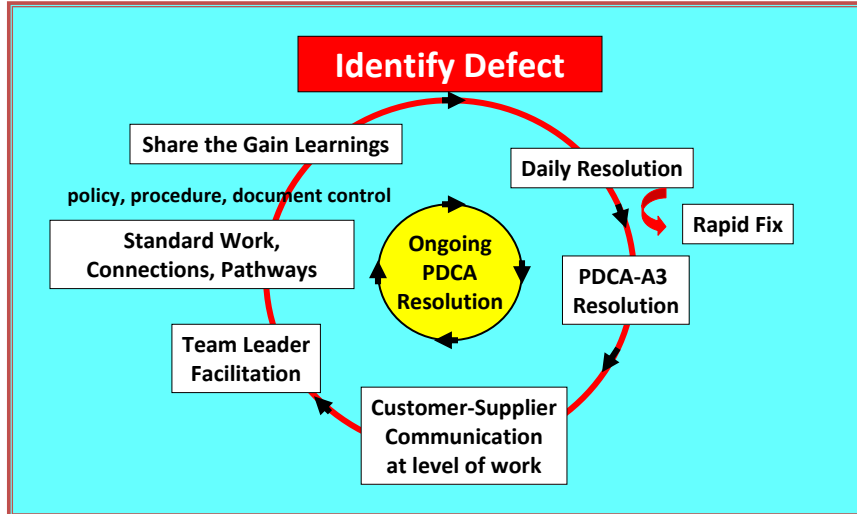
Henry Ford Production System

**SYSTEMATIC
PROCESS to
FIX DEFECTS**

Henry Ford Production System

The Process of Process Improvement

HENRY FORD PRODUCTION SYSTEM



Henry Ford Production System

SYSTEMATIC
WORK RULES
FROM TPS

Henry Ford Production System

Standardization is the Cure -Observe & Reinforce- Systematic Work Rules

Variation is the *Enemy* of Quality

1. Activities
2. Connections
3. Pathways
4. Method of Improvement

Spear S, Bowen HK: Decoding the DNA of the Toyota Production System.
Harvard Business Review, 1999.

“Today’s standardization, instead of being a barricade against improvement, is the necessary foundation on which tomorrow’s improvement will be based.”

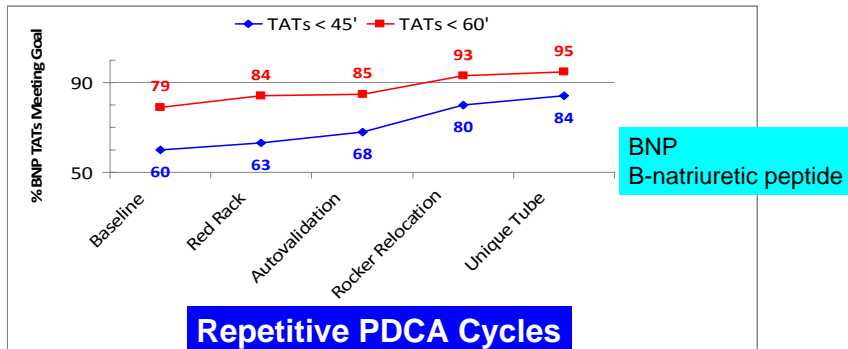
– Henry Ford

Henry Ford Production System

WORKER KAIZEN SOLUTIONS

Henry Ford Production System

Continual Improvements Toward Goal



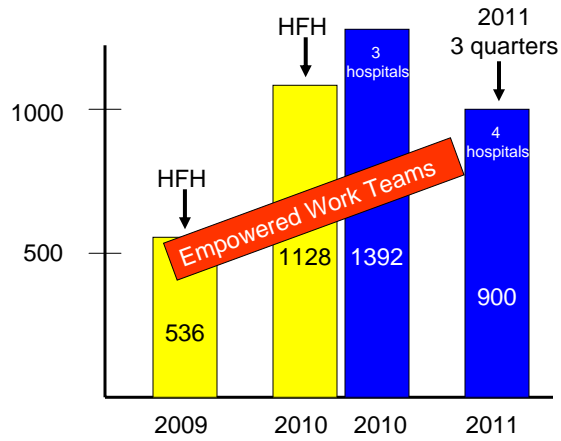
Henry Ford Production System

LEVERAGING
PRODUCTIVITY
OF TEAMS

Henry Ford Production System

TEAMWORK OUTCOME

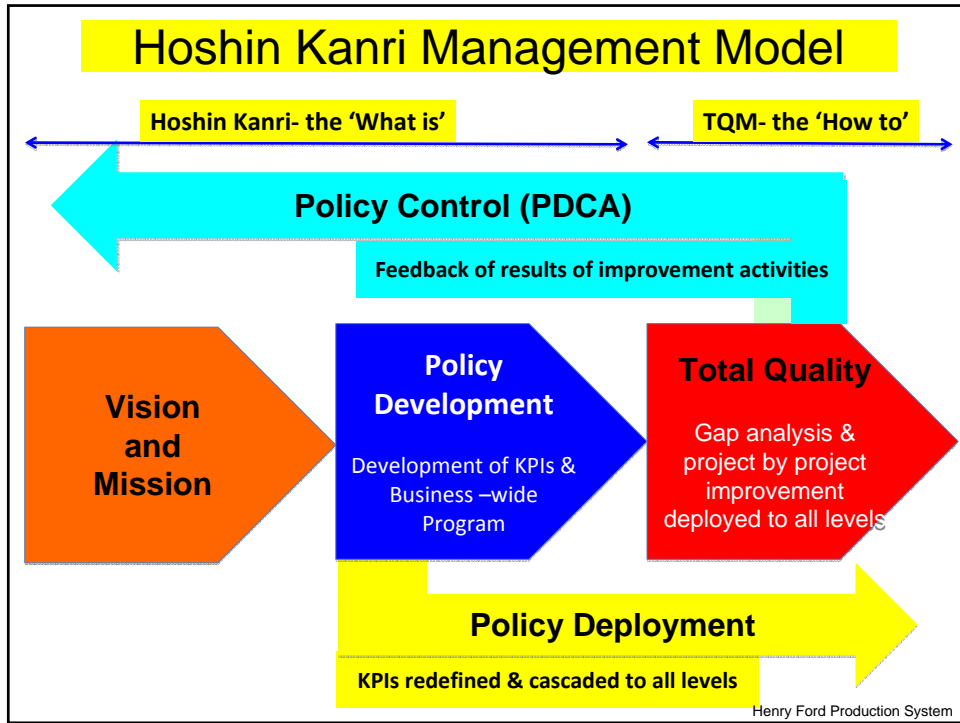
Total Process Improvements
Pathology & Laboratory Medicine Service Line



Henry Ford Production System

Strategic Planning System

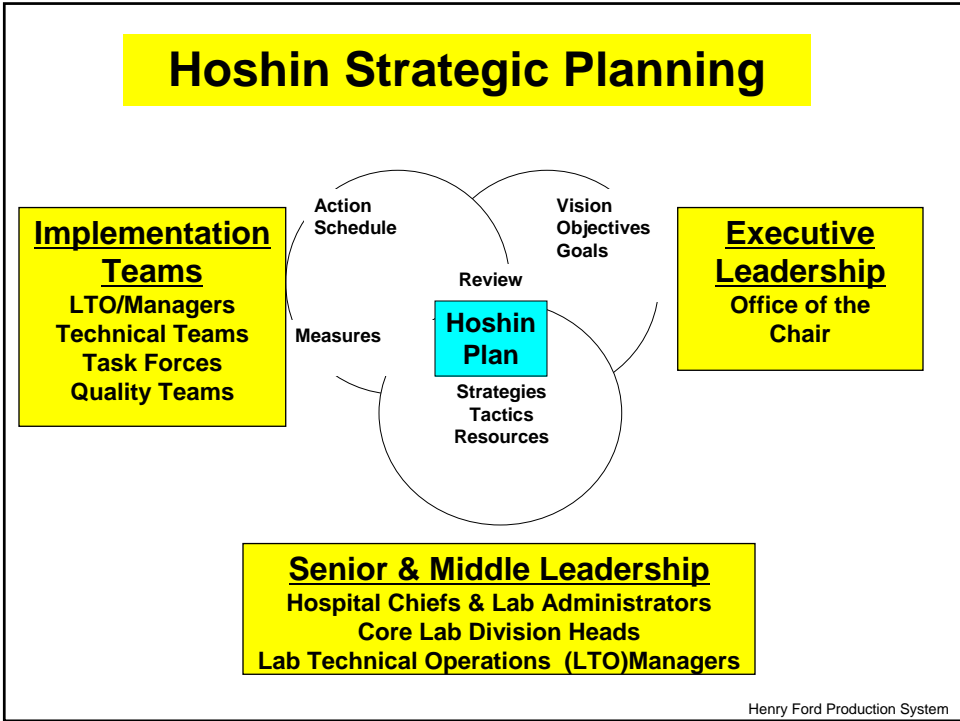
Henry Ford Production System



Long Range Strategic Planning

	Service Line Need	HFH	HFMG	WBLM	MAC WAR	WYAN Brownstown	MAC CL TWP
Stat Labs	9	1	3	1	1	2	1
Blood Banks	6	1	1	1	1	1	1
Cytology	1	1	0	0	0 2010	0 2010	0 2011
Histology	1	1	0	0	0 2010	1 2012	0 2011
Microbiology	1	1	0	0	0 2010	1 2012	1 2012
Immuno-chemistry	1	1	0	0	1 2012	1 2012	1 2012
Transplant	1	1	0	0	0	0	0

Henry Ford Production System



Sustaining Systems

Henry Ford Production System

Tactics That Sustain a New Work Culture

➤ GOAL SETTING

- Hoshin kanri strategic planning and goal setting
- Quality goals identified, prioritized & pushed to level of worker

➤ PEOPLE ROLES & RESPONSIBILITIES

- Identified workstation teams and leaders
- Employees in charge of own jobs, design standardized work

➤ METRICS

- Expect metrics of reliability & consistency in each workstation

➤ COLLABORATION CULTURE

- Promote horizontal cooperation, customer-supplier, team focus

➤ MANDATORY EDUCATION & RE-EDUCATION

- Include competency assessment in CQI for all workers

➤ LEADER FACILITATED MEETINGS

- Expect routine leader & worker meetings, no exceptions

➤ PERSONAL ACCOUNTABILITY FOR PROGRESS

- Visual trackers of daily defects and improvements
- Monthly worker presentations of their improvements
- Performance evaluations leaders & workers, include behaviors

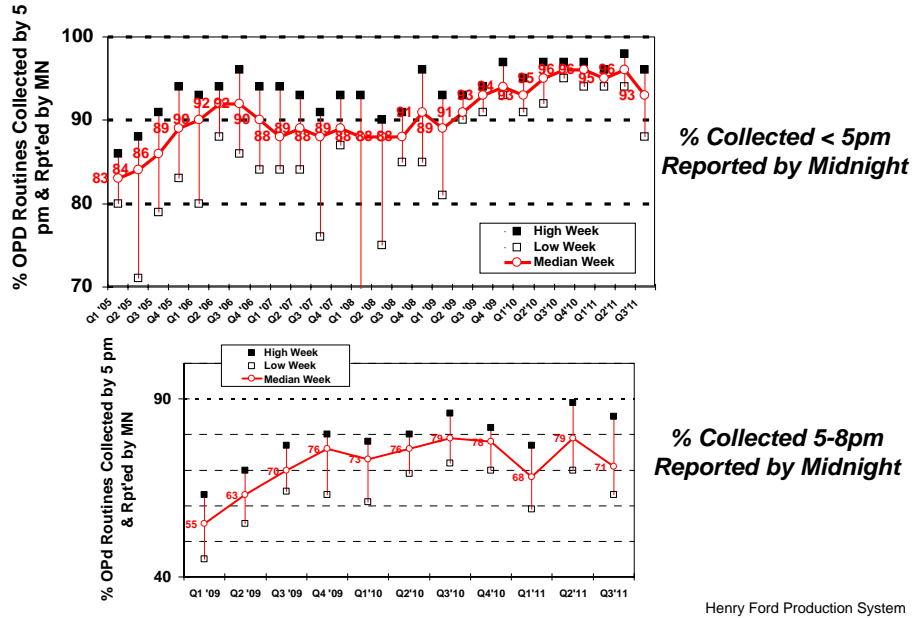
➤ PUBLIC PRESENTATION & RECOGNITION EVENTS

Henry Ford Production System

CULTURE
SUCCESS

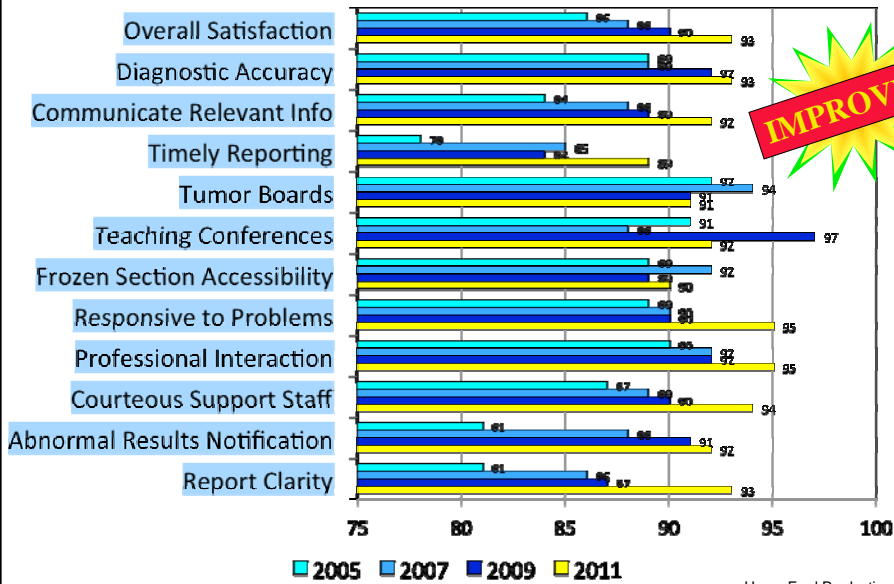
Henry Ford Production System

HFH OPD Routine TATs



Anatomic Pathology Clinician Satisfaction

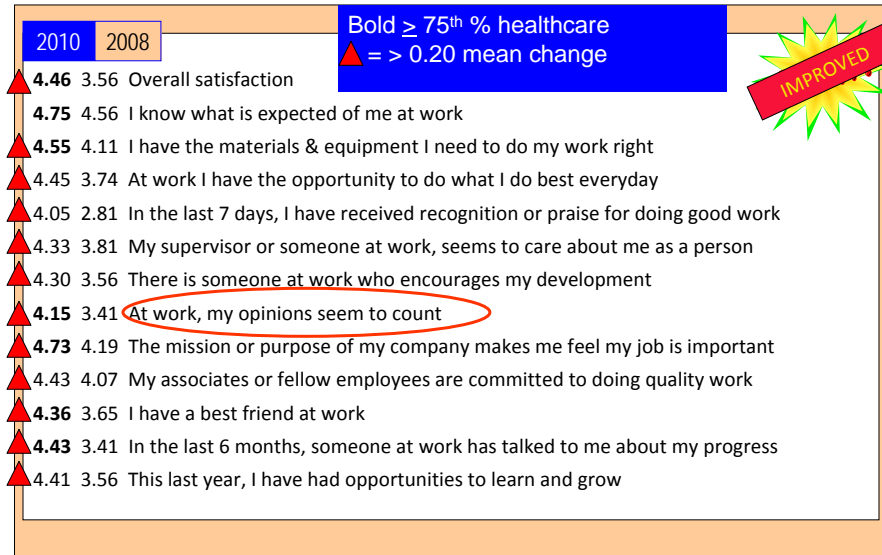
Percent Favorable Score



Employee Engagement

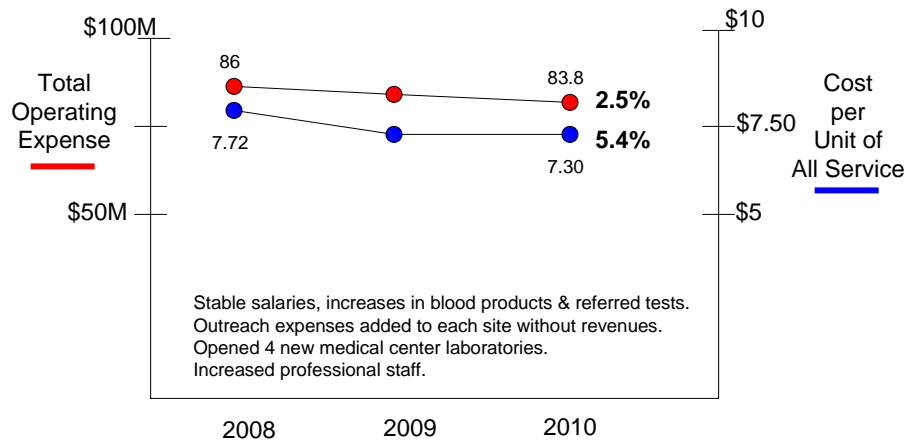
Technical Staff
Surgical Pathology

Gallup Q¹² Survey



Overall Cost Improvement

4 acute care hospitals and 26 regional medical centers



Culture

The Bottom Line

The real challenge is to expand
beyond understanding Lean as a set of tools,
and more aggressively pursuing
an understanding of the
comprehensive approach to managing organizations
so they are capable of
self-diagnosis, learning, and relentless
internally generated improvement and innovation.

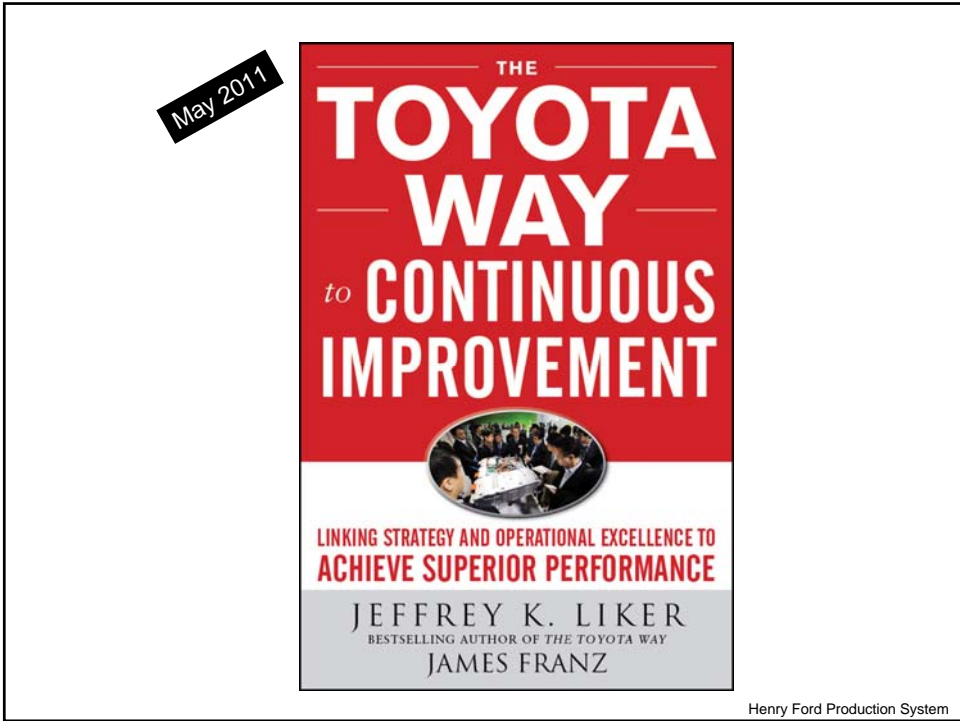
-Steven Spear 2010

Henry Ford Production System

**As Leader,
this is your
JOB #1**

**"Our system of management is not a system at all;
it consists of planning the methods of doing the
work as well as the work."
-Henry Ford**

Henry Ford Production System



Lean Deployment Phase I – Applying & Teaching Tools

Outer Circle
Apply & Teach
Tools

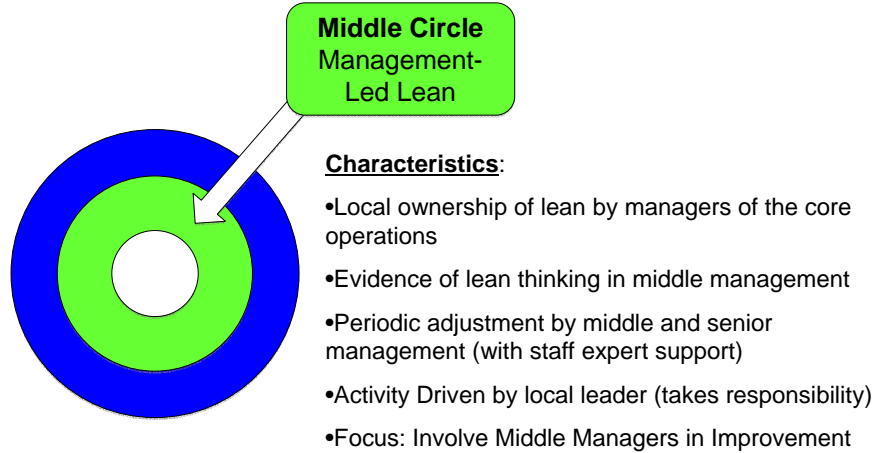
Characteristics:


- Beginning of Lean Activity
- Focus on teaching and using the tools
- Activity is “Event” based (e.g., kaizen events) or “Project” based (e.g., kaikaku)
- Activity is lean “expert” driven and directed (External)
- Focus: Fix processes to demonstrate results

Warning: This phase by itself is not self sustaining. Entropy Will Set in Degrading to a Lean Facade!

Modified version of figure by David Meier. From *The Toyota Way to Continuous Improvement* by Liker & Franz

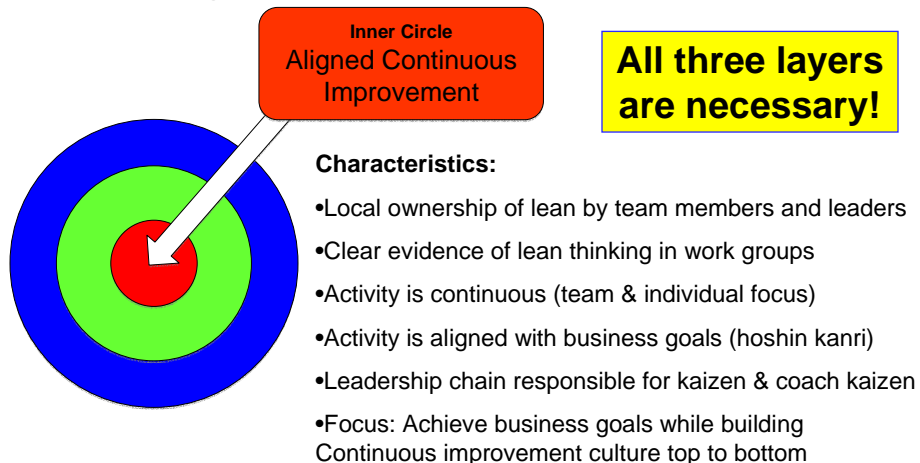
Lean Deployment Phase II – Management-Led Lean




 **Warning: Management Led Lean can arrest entropy, but expect Episodic improvement**

Modified version of figure by David Meier. From *The Toyota Way to Continuous Improvement* by Liker & Franz

Lean Deployment Phase III – Aligned Continuous Improvement



 **Warning: This is an ideal vision you will never fully achieve and requires a life-long commitment!**

Modified version of figure by David Meier. From *The Toyota Way to Continuous Improvement* by Liker & Franz

Creating the HFPS Lean Enterprise

Keys to Success

- **Vision**
 - Top down & bottom up pursuit zero defects
- **Philosophy & Management System**
 - Continuous improvement, customer & shop floor focus, people development & empowerment
- **Leaders own it or fail**
- **Structure for team-driven change**
- **Education and more education**
- **Metrics**
- **Meetings, all levels**
- **Aligned strategies and priorities**
- **Reinforcers**

Henry Ford Production System

Future

**“If everyone is moving forward together,
then success takes care of itself.”**

-Henry Ford

“Learning is not compulsory, neither is survival”

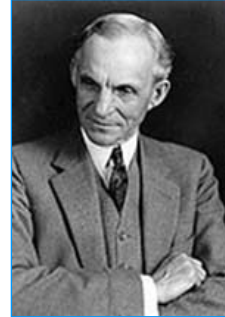
-W. Edwards Deming

www.HenryFord.com/pathology

Henry Ford Production System

www.HenryFord.com/pathology

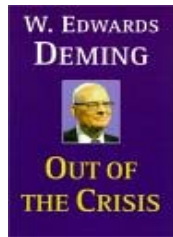
- Henry Ford Production System
- 2 day LEAN Training Courses
- 14 hours CME
 - Nov 11-12, 2011
 - Feb 16-17, 2012
 - April 11-12
 - June 21-22
 - Aug 2-3
 - Oct 11-12



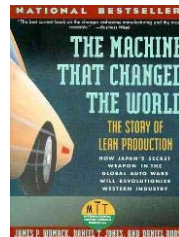
We know from the changes that have already been brought about that far greater changes are to come, and that therefore we are not performing a single operation as well as it ought to be performed. – Henry Ford

LEAN =
a different
way of
WORKING

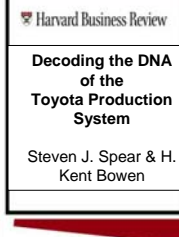
References



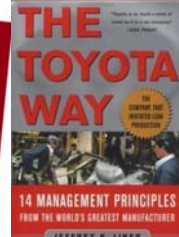
1982



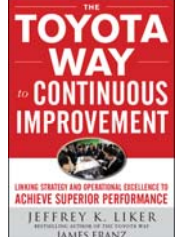
1990



1999



2004



2011

Transforming to a Quality Culture
The Henry Ford Production System
Richard J Zarbo, MD, DMD, and Rita D'Angelo, MS, ASQ, COE, SSBB
American Journal of Clinical Pathology 2006;126:Suppl S21-S29