

# *What is Lean?*

A Culture of Continuous Improvement  
The Henry Ford Production System



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

# Status Quo

**“The only things that evolve by themselves in an organization are disorder, friction and malperformance”**



Peter F. Drucker

# Toyota in the House of



**LEAN =**  
**Deming**  
**(perfected by)**





THE W. EDWARDS DEMING INSTITUTE®

*W. Edwards Deming®*

**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**

**DEMIING'S**  
**14 POINTS**  
*CREATE*  
*CULTURE*

# 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

# *The Challenge*

“We cannot solve our problems with the same thinking we used when we created them.”

-Albert Einstein



# CULTURE OF CONTINUOUS IMPROVEMENT

# Toyota Culture



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

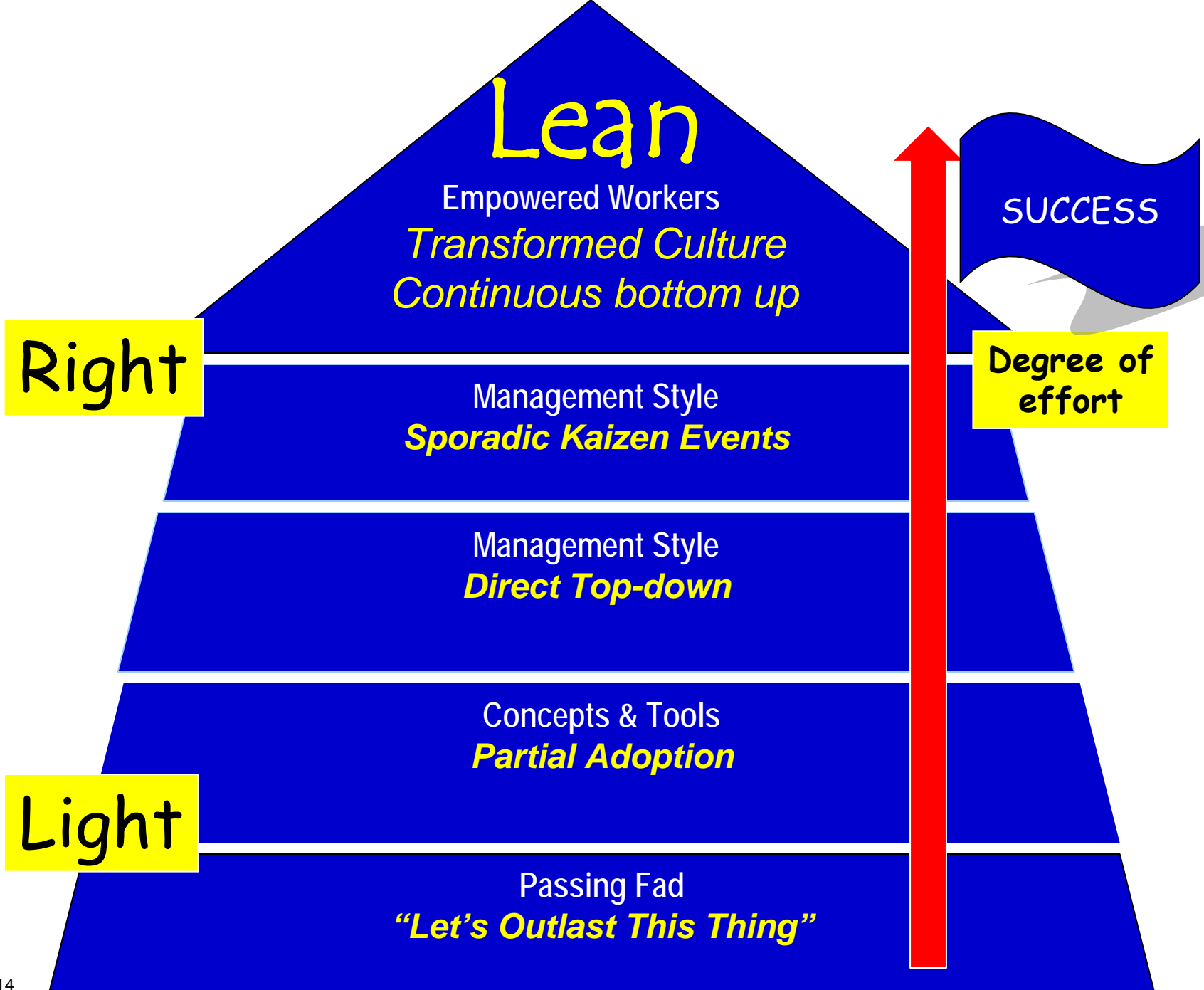
**The key is the culture –**  
that supports and stimulates continuous growth and improvement.”

(J. Womack)

# One Quality Vision, Mission, Values

## HENRY FORD PRODUCTION SYSTEM

- **Best in Class**
  - **Every Life Deserves World-Class Surgical Services**
- **Culture of continuous improvement**
  - **Relentlessly Pursuing Perfection**
- **Culture of worker empowerment for change**
  - **Never Make, Accept, or 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**



# CULTURE OF EMPLOYEE EMPOWERMENT

# Common, Continuous Problem Solving Culture



Henry Ford  
Production System

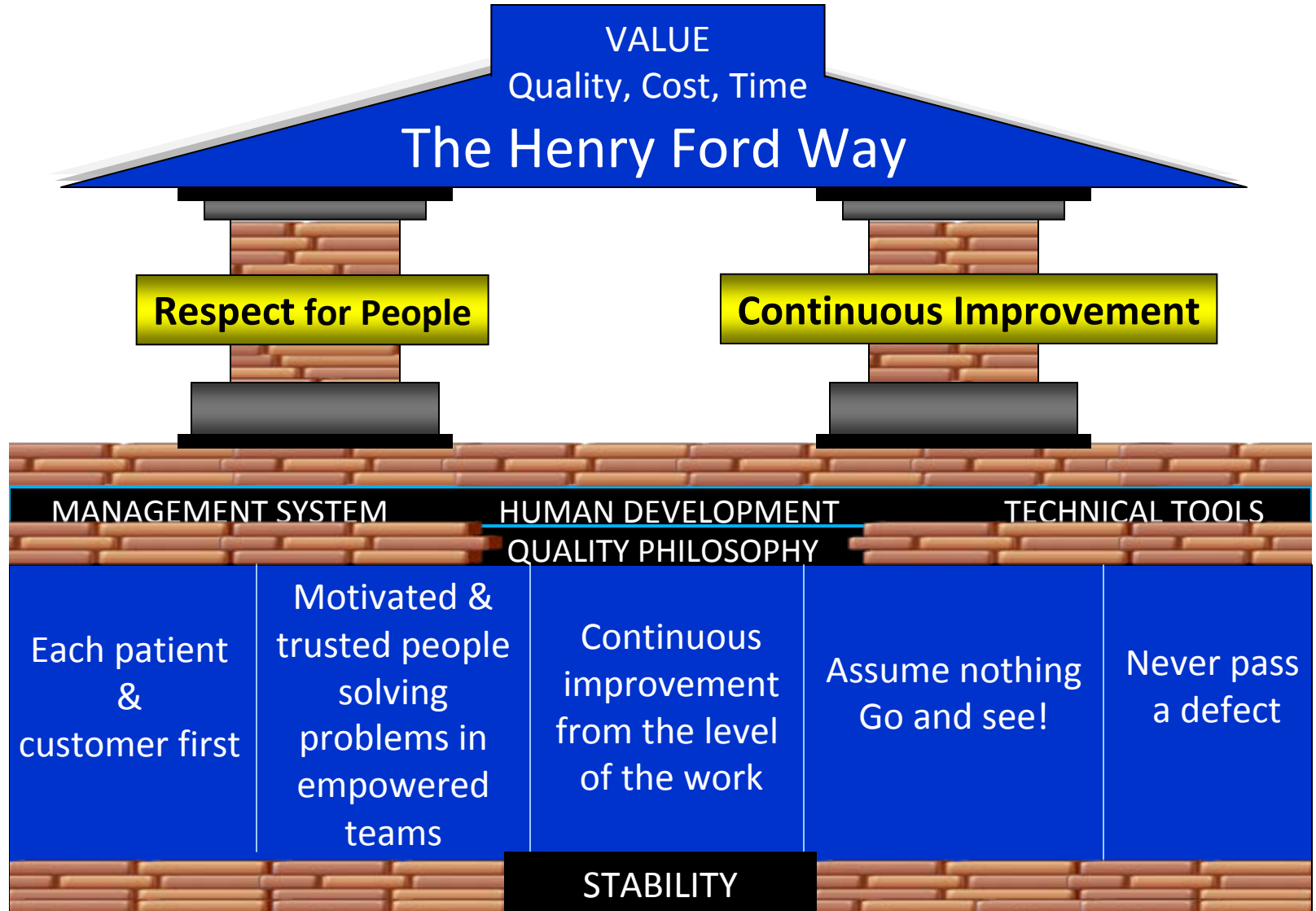
**“Most people spend more time and energy going around problems than in trying to solve them.”**

*-Henry Ford*



# Philosophy That Promotes People

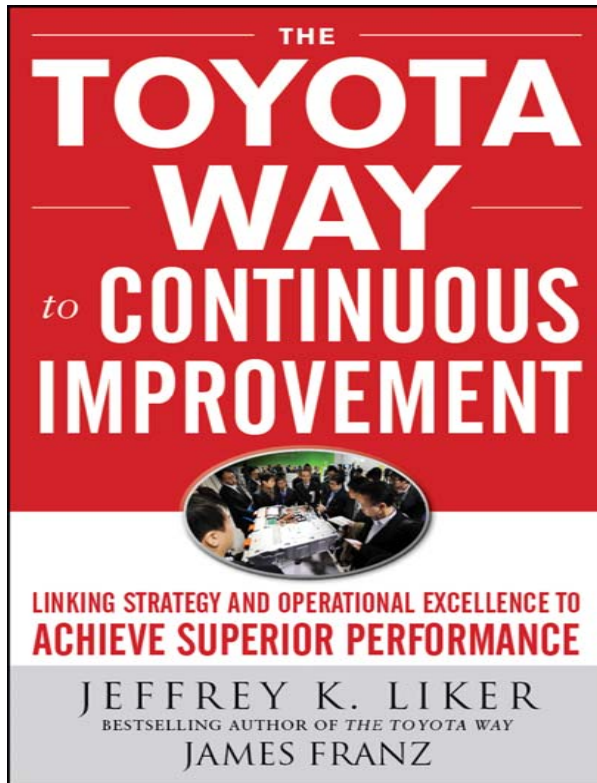
## HENRY FORD PRODUCTION SYSTEM



# Continuous Improvement Culture

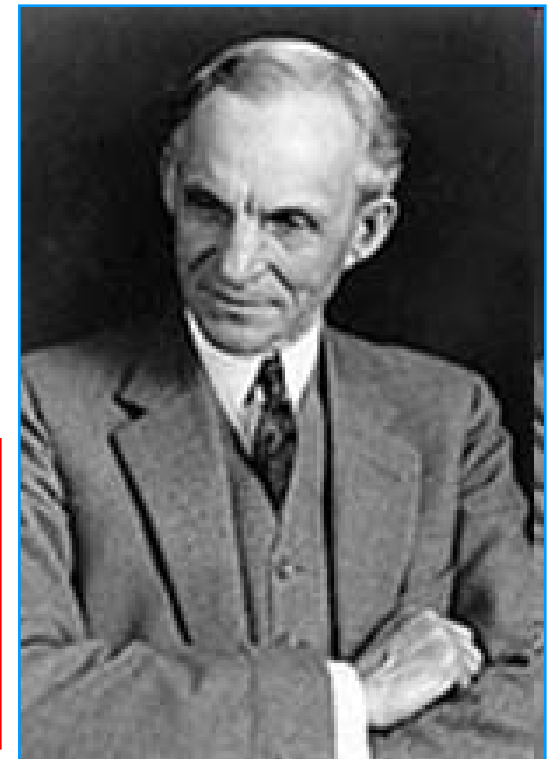
***“We know from the changes that have already been brought about that far greater changes are to come, and that therefore we are not performing a single operation as well as it ought to be performed.”***

– Henry Ford



**“Relentlessly pursuing perfection!”**

Chapter 9  
**Bringing Ford’s Ideas Alive at Henry Ford Health System Labs through PDCA Leadership**





# CHANGING CULTURE

# Deming

*"Start as soon as possible to construct with deliberate speed an organization to guide continual improvement of quality."*

# Integrated System to Achieve Culture of Continuous Improvement

- **Standard Work**
- **5S**
- **Visual workplace**
- **Continuous flow**
- **Pull production**
- **Kanban**
- **Just in Time**
- **Load leveling**
- **Batch size**
- **Mistake proof**

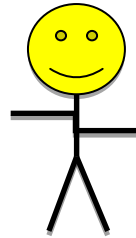


**Tools of  
Improvement**

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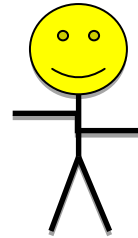


# Philosophy of People 1st

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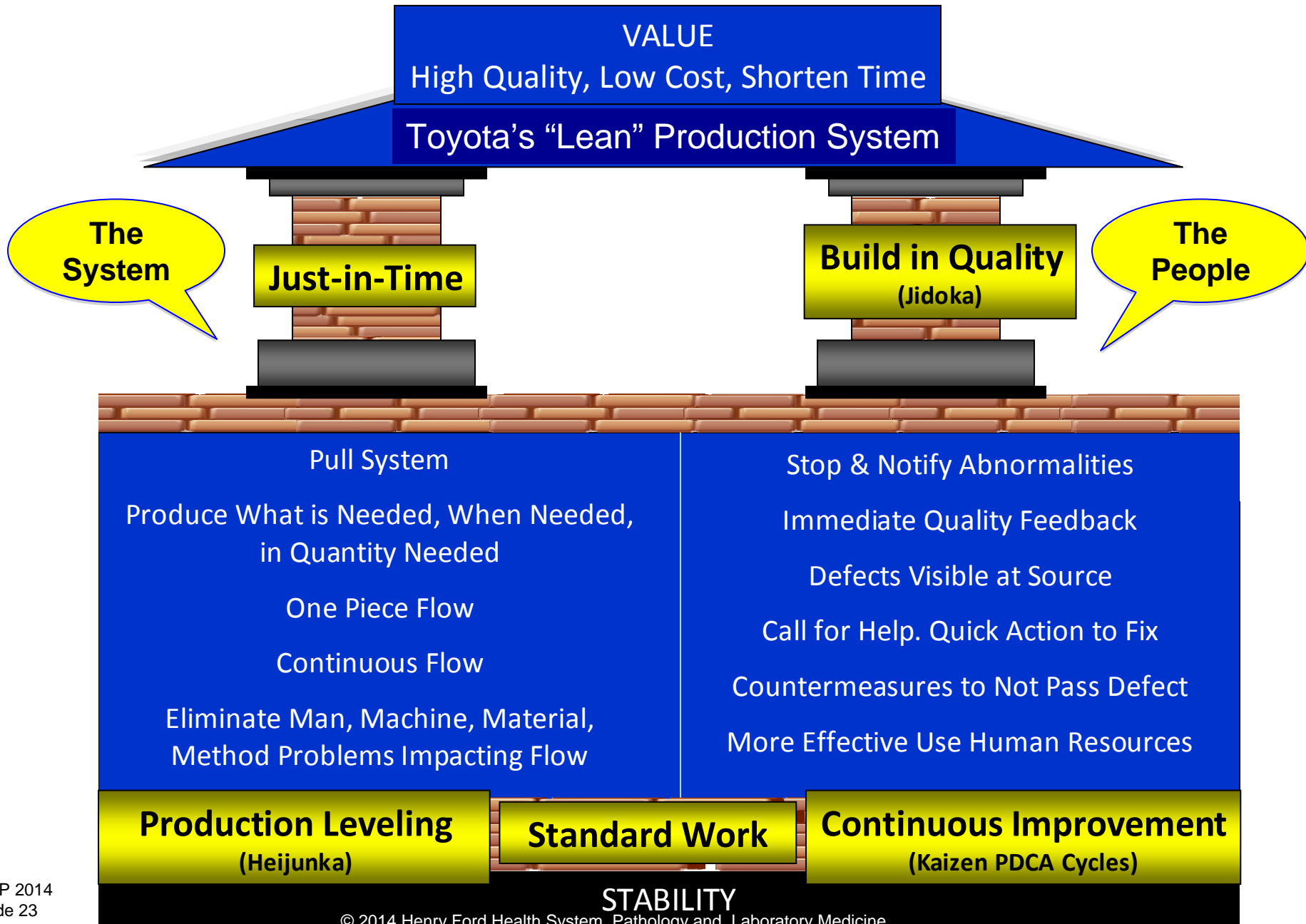
**Tools of Improvement**



- Customer 1<sup>st</sup>
- Continually develop your most valuable resource, your PEOPLE
- Continuous improvement
- From the level of the work
- Blameless management

**Cultural Philosophy**

# Foundations of Lean Production



# Blameless

“Don’t find fault, find a remedy;  
anybody can complain.”

*-Henry Ford*



**“On the internet, nobody knows you’re a dog.”**



# Educate to Work Differently

# What is my role and what do you want me to do?

- **Physicians, Leaders, Managers, Supervisors, Coordinators**
- **Quality Team Leaders**
- **All employees**

1. Be engaged
2. Own it
3. Improve it
4. Everyday

# Continually Strive to Create the IDEAL Work Condition

**Delivery of products & services should pursue the Ideal**

Production that is

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

# Basics of LEAN

## Specify Value Desired by Customer

- Identify value stream & challenge all wasted steps
- Manage towards perfection (zero defects)

## Reduce & Eliminate Waste, Continually

- Overproduction
- Time waiting
- Transportation
- Processing
- Stock on hand
- Movement
- Defective products

Process Focused  
Incremental Improvements

Specific Ideals, Rules,  
Operational Principles

# 4 Rules of Work Design

Decoding the DNA of the Toyota Production System. Spear & Bowen  
Harvard Bus Rev Sept-Oct 1999

## ■ Rule 1- STANDARD ACTIVITIES

- Specifications document all work processes (include content, sequence, timing, location & expected response (how do you do your work))

## ■ Rule 2- STANDARD CONNECTIONS

- Connections with customers & suppliers (directly link every customer & supplier (no buffers or responses))

## ■ Rule 3- STANDARD FLOWS

- Every process follows a predefined, single, simple & direct flow (no looping or forking)

## ■ Rule 4- IMPROVEMENT & WORKER EMPOWERMENT

- Workers at level where work is done, guided by a teacher, improve their own work, using data

**STANDARDIZATION  
REDUCE VARIATION**

# Management Systems for Continuous Improvement

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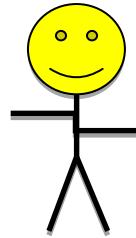


**Tools of  
Improvement**

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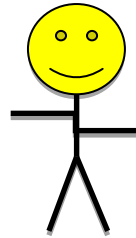




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**Tools of Improvement**



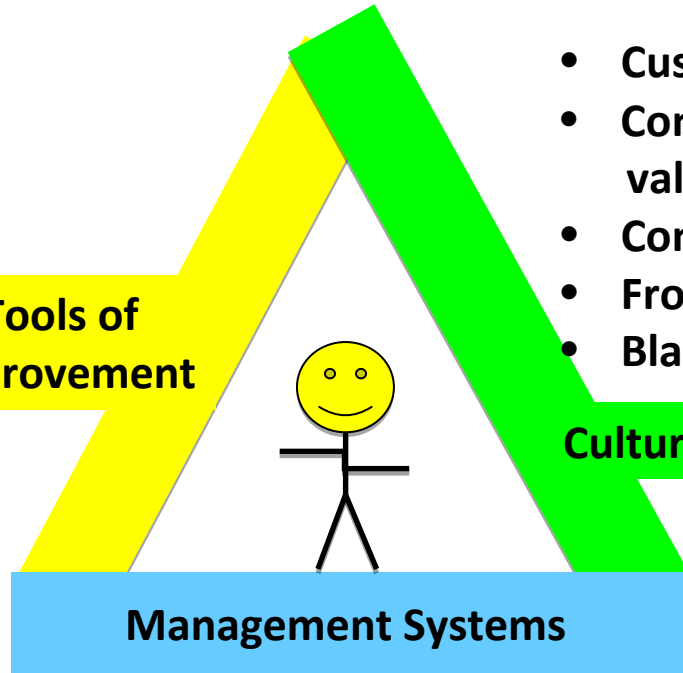
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**Cultural Philosophy**

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**Tools of Improvement**



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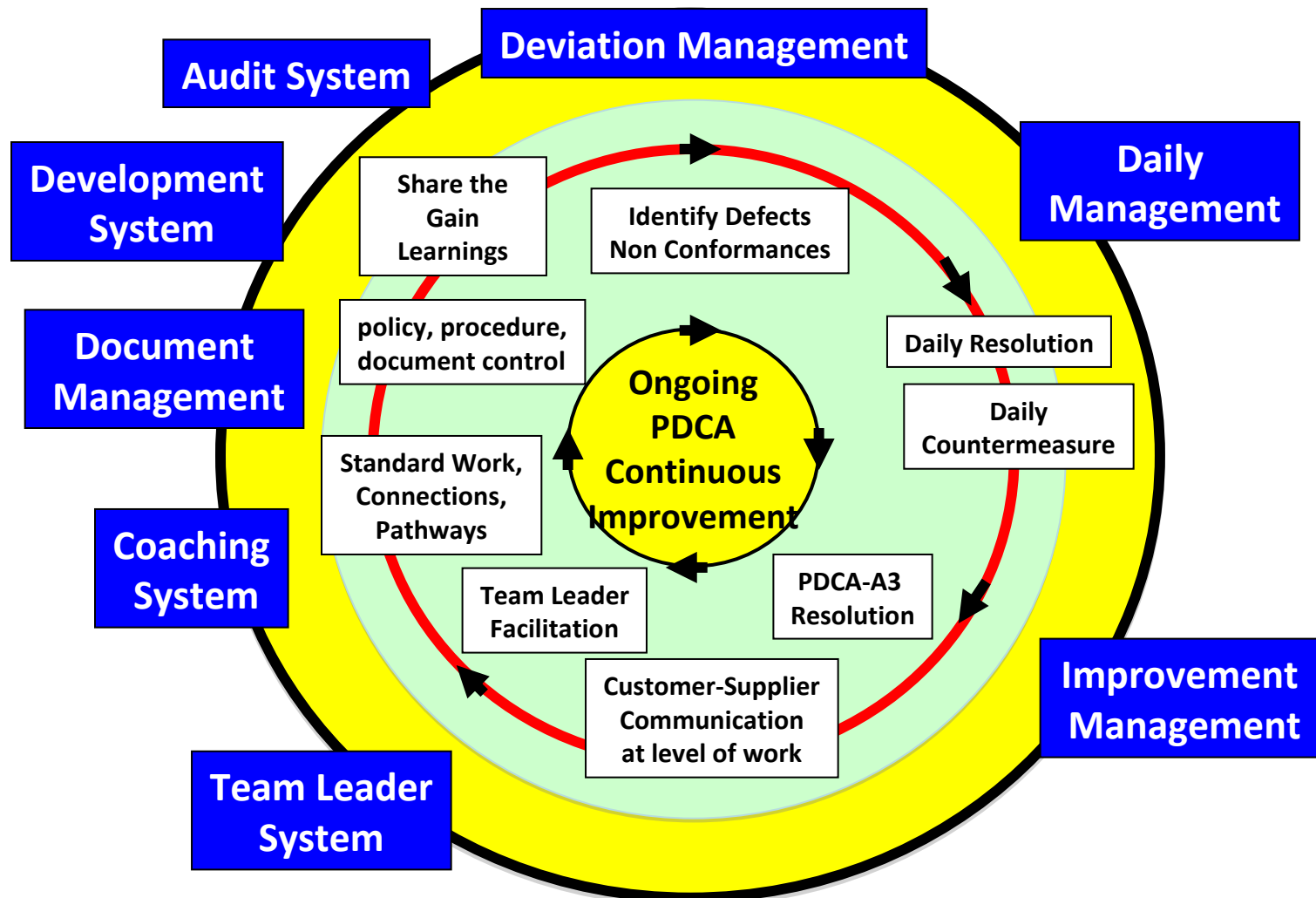
**Cultural Philosophy**

**Management Systems**

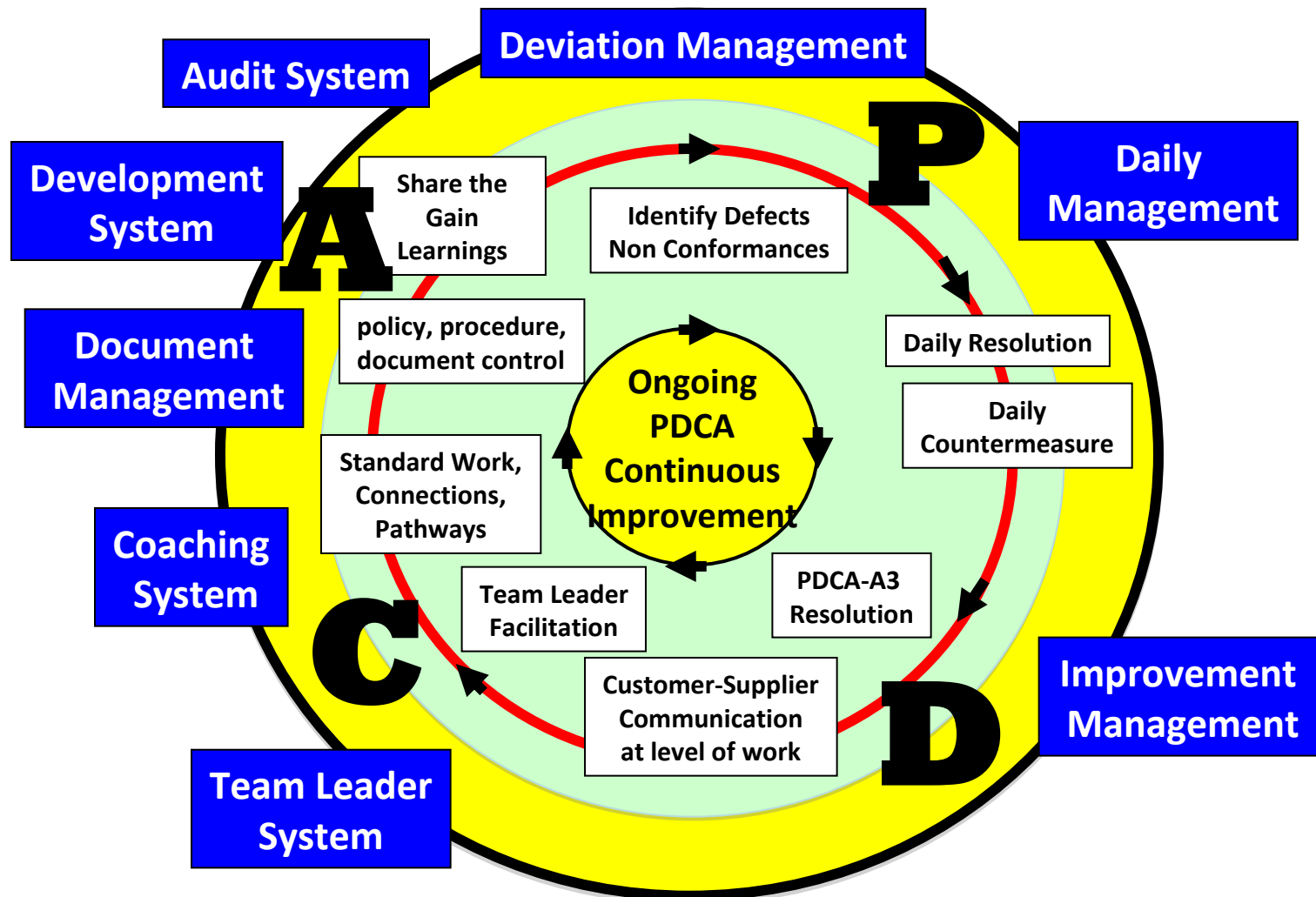
- Hoshin Planning/Policy deployment
- Team leader system
- Improvement management (kata)
- Coaching and development (kata)
- Deviation management
- Daily management
- Document management

# EMPOWERING SUB-SYSTEMS

# The Processes of Managing for Continuous Improvement



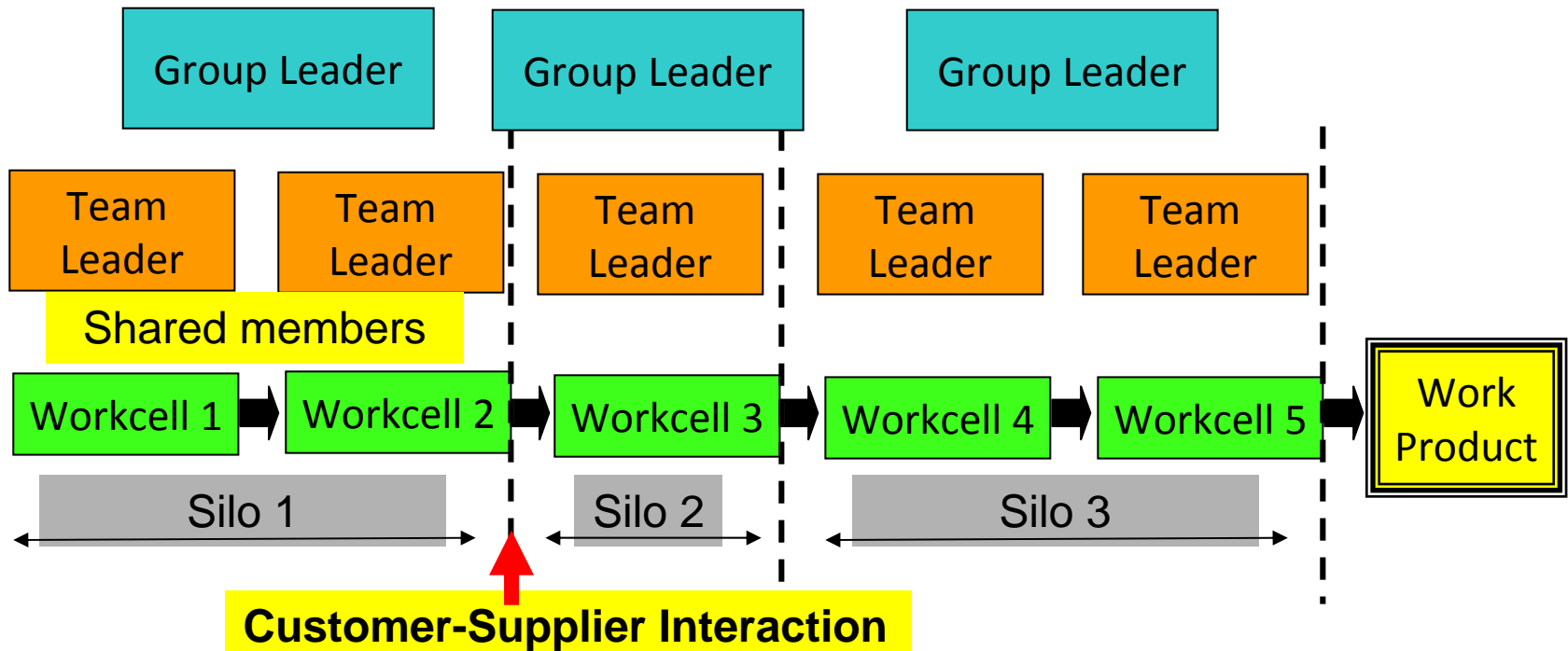
# The Processes of Managing for Continuous Improvement



# EMPOWERING STRUCTURE

# Structure for Change

## Worker Driven Continuous Improvement



1. Create organizational structure for authorized change
2. Identify group & team leaders by workstations
3. Align in path of workflow for horizontal management

# EXPECTATION OF MANAGERS



# 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)

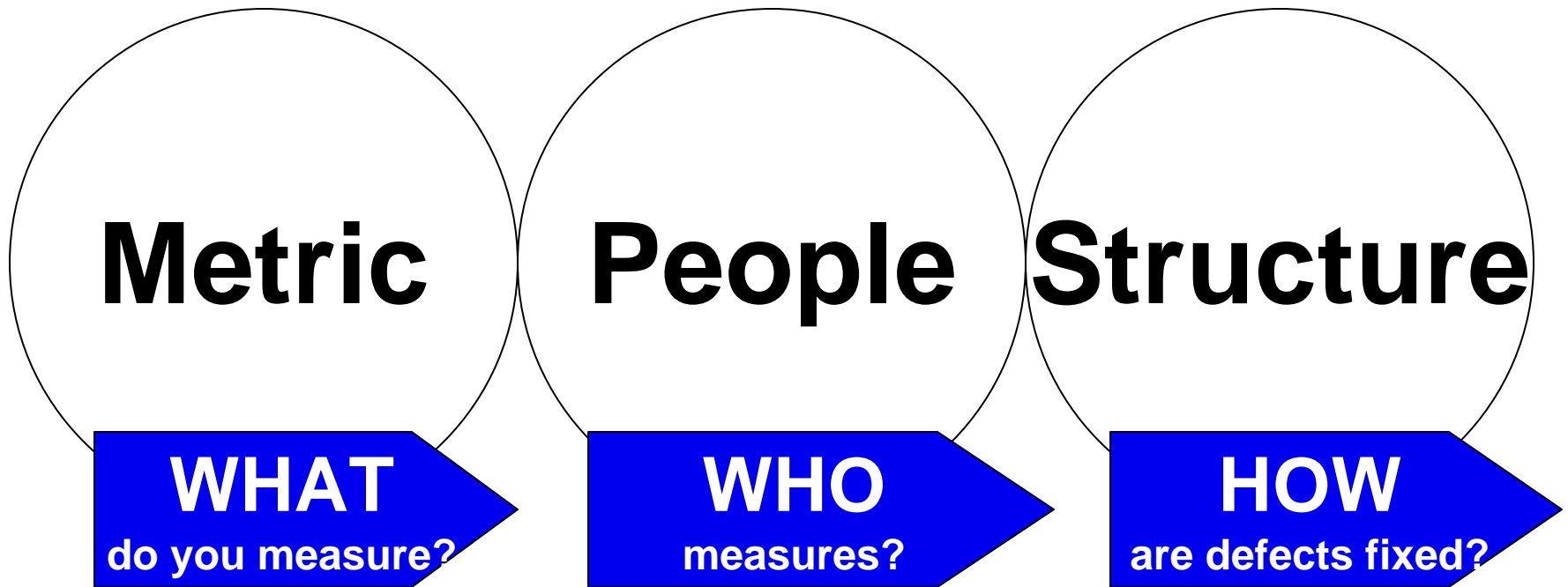
# Managers Weekly Checklist

***"You get what you inspect not what you expect"***

- 1. Know and understand the variation in your work via metrics**
- 2. Engage the workforce in quality improvements, develop your people's skills**
- 3. Deviations/Non-conformances outliers and trends**
- 4. Temp humidity checks -completeness of documentation, root cause and corrective actions**
- 5. 5S activity documentation**
- 6. Posted job aides and all visuals reviewed and updated**
- 7. New or revised procedures reviewed with staff and staff competencies verified**
- 8. New problems of risk (mis-ID, safety) and resolutions discussed**
- 9. White Board review leading to interventions and process improvements**
- 10. Ongoing and planned process improvements reviewed**
- 11. Inventory and kanban check**
- 12. Lead then delegate "Share the Gain"**

**“If you can’t measure it,  
you can’t improve it”**

# The TRIAD of Quality!



# Managing the Visual Workplace

## Whiteboards

Daily Visual Capture  
of Select  
Non-Conformances  
by Workstations

## Deviation Management

Daily Tracking of All  
Non-Conformances

With Documented  
Immediate Resolutions or  
Root Cause Analysis with  
Corrective/Preventive  
Actions

## Daily Management Boards

Tracking & Trending  
of Select  
Performance  
Metrics  
by Workstations

PDCA-Based Continuous Improvements



“A legacy of quality”

## Daily Management Board

|                     |                  |                                   |                          |                    |
|---------------------|------------------|-----------------------------------|--------------------------|--------------------|
| <b>Q</b><br>Quality | <b>T</b><br>Time | <b>I</b><br>Inventory<br>(or WIP) | <b>P</b><br>Productivity | <b>S</b><br>Safety |
|---------------------|------------------|-----------------------------------|--------------------------|--------------------|

# EXPECTATION OF WORKERS

**CQI = Daily  
Team Sport**



# LESSON

“Getting good players is easy. The hard part is getting them to play together.”

*Casey Stengel*  
*Baseball manager and philosopher*

A detailed painting of a factory interior, likely from the early 20th century. The scene is filled with workers in various uniforms (blue shirts, overalls, caps) engaged in different tasks. They are surrounded by complex machinery, including conveyor belts, gears, and large metal components. The lighting is dramatic, with strong highlights and deep shadows, creating a sense of a busy, industrial environment. The overall style is reminiscent of the Industrial Revolution era.

**Redefine the Expectation of “Work”**

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

**“It’s the work, not the man that manages.”**

*-Henry Ford*

# 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**

VISUAL  
WORKPLACE  
-DEFECTS-  
*BLAMELESS CULTURE*

# What is a defect?

Poor quality of service or product that makes you:

- Stop your work
- Reject it
- Return it to sender
- Delay your work or fix it yourself
- Not what you or customer would be better

**Measures of Variation**

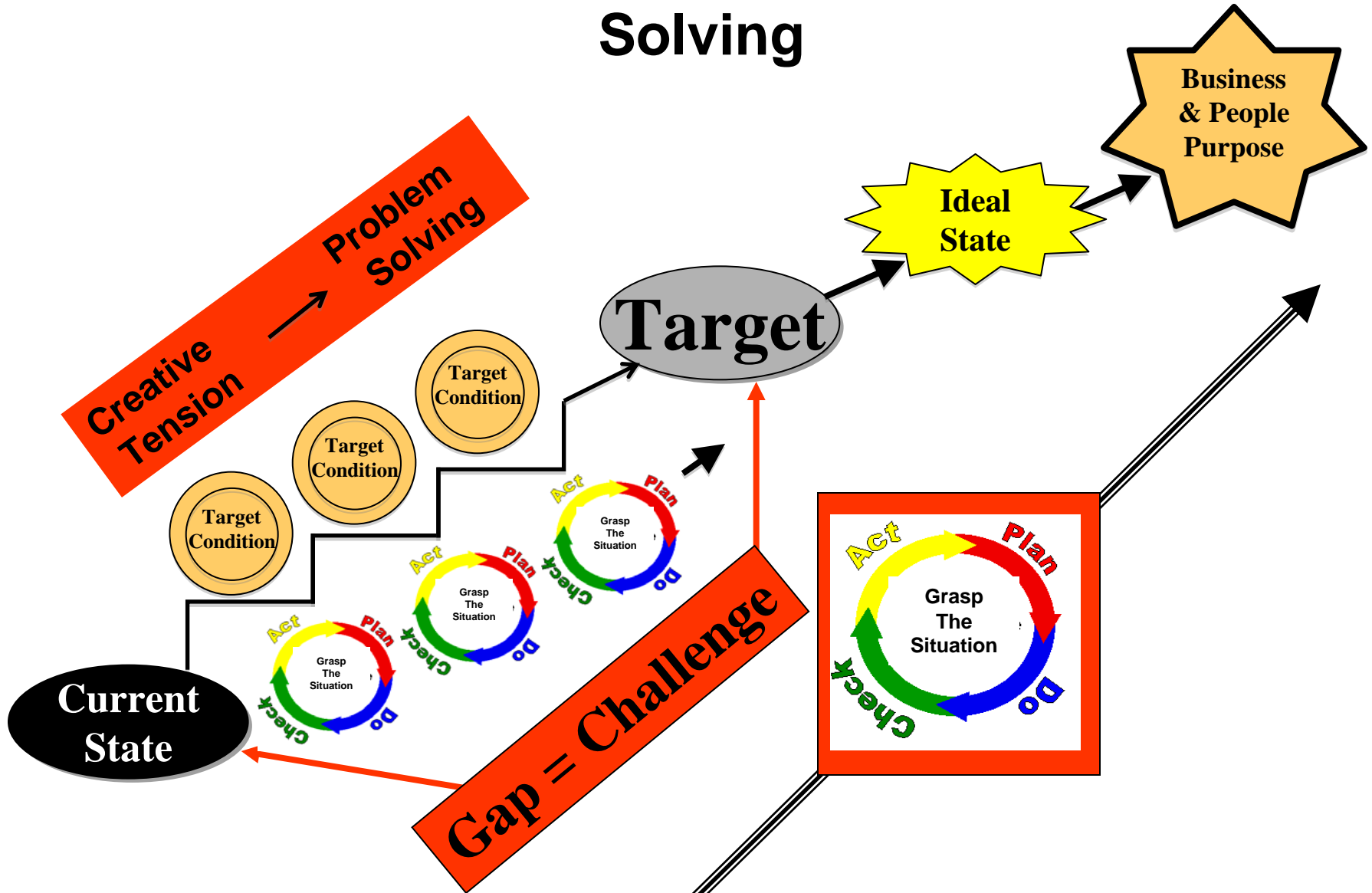
**= WASTE**  
**= REWORK**

**Error** = hurts someone

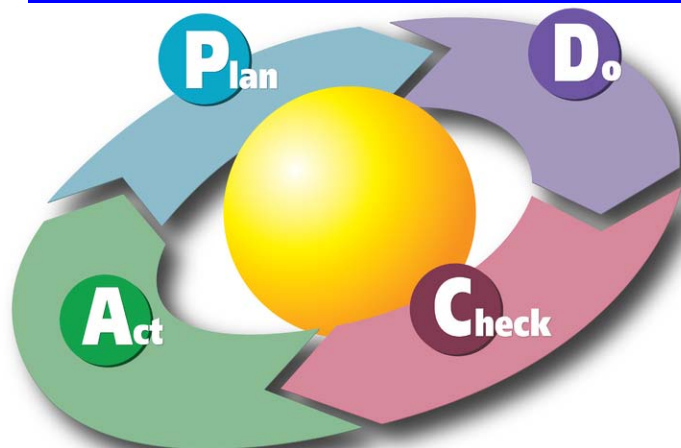
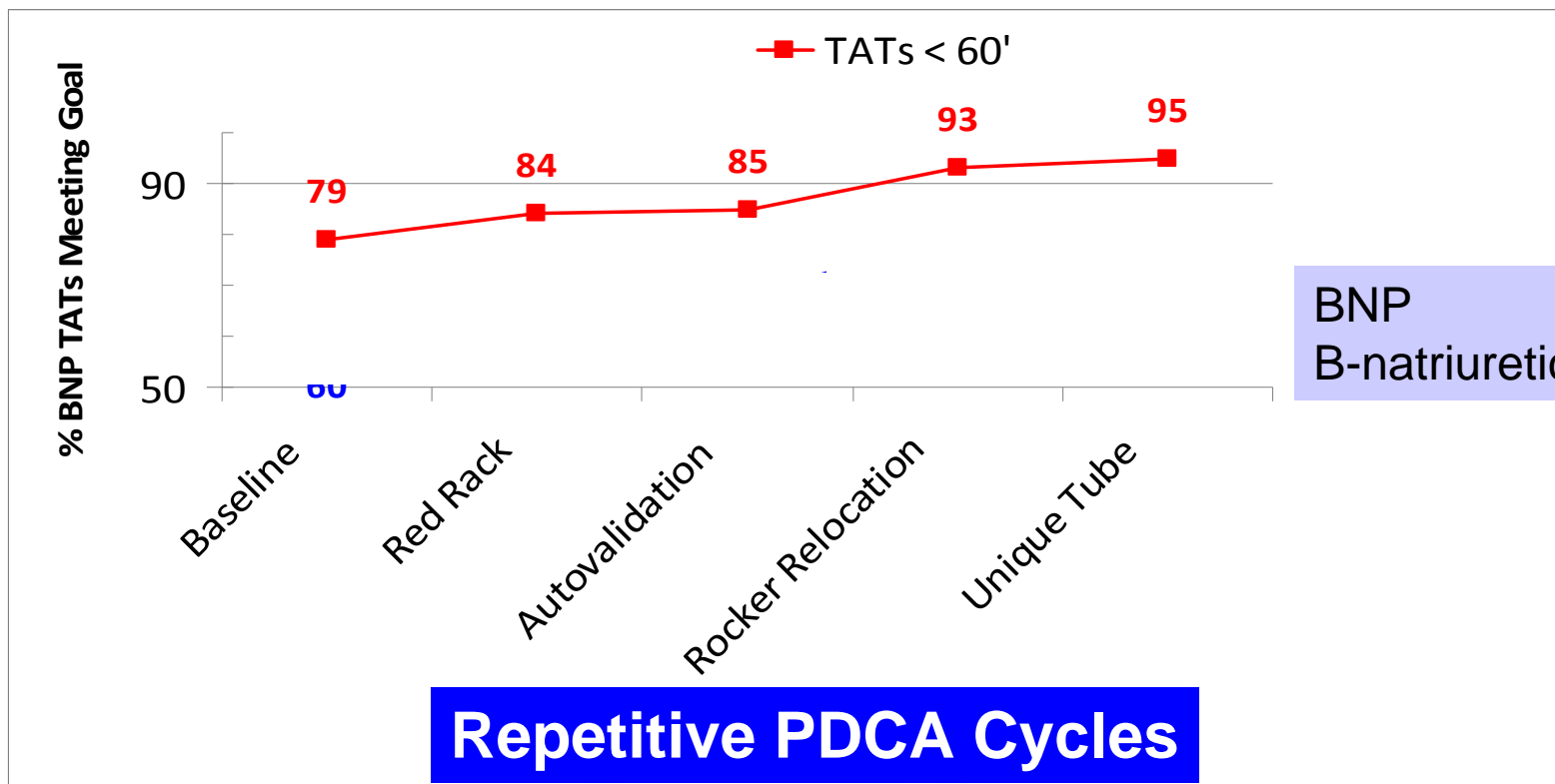


# Structure & Process for CQI from “shop floor”

# Drive Comes from Working Toward the Purpose & Clear Targets Through Creative Problem Solving



# Continual Improvements Toward Goal





# Expected Outcomes of Cultural Change

# Expected Outcomes

- Reduction in rework
- Throughput
- Timeliness
- Unused capacity
- Productivity and efficiency
- Patient and Employee Safety
- Regulatory deficiencies
- Job satisfaction
- Customer satisfaction
- Cost and Profitability

**Rework  
WASTE**

# Eliminate Rework

## Surgical Pathology

|                          | 2006   | 2007   | 2008    |                      |
|--------------------------|--------|--------|---------|----------------------|
| Total SP Cases           | 1690   | 1791   | 1000    |                      |
| Cases with Defects       | 472    | 223    | 24      | <b>Fix Real-time</b> |
| Total Defects            | 494    | 288    | 24      |                      |
|                          | 1 of 3 | 1 of 8 | 1 of 40 |                      |
| Defective Case Frequency | 27.9%  | 12.5%  | 2.5%    |                      |
|                          | 50/day | 30/day | 5/day   |                      |
| Defect reduction         | 55%    | 91%    |         |                      |

# DEFECTS

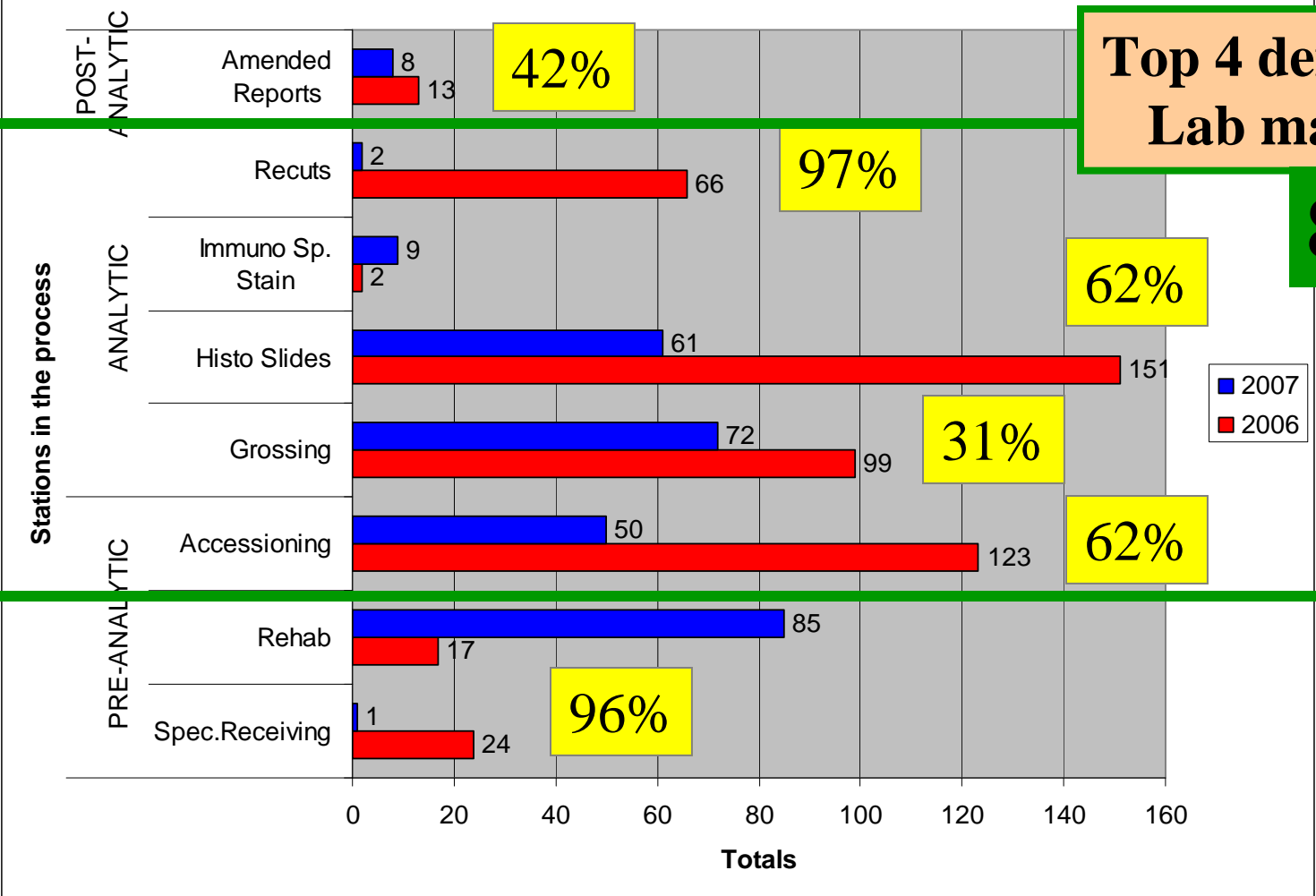
## Power of People

*"My theory of waste goes back of the thing itself into the labour of producing it"*  
 -Henry Ford

Defect Comparison 2006 to 2007

**Top 4 defects  
 Lab made**

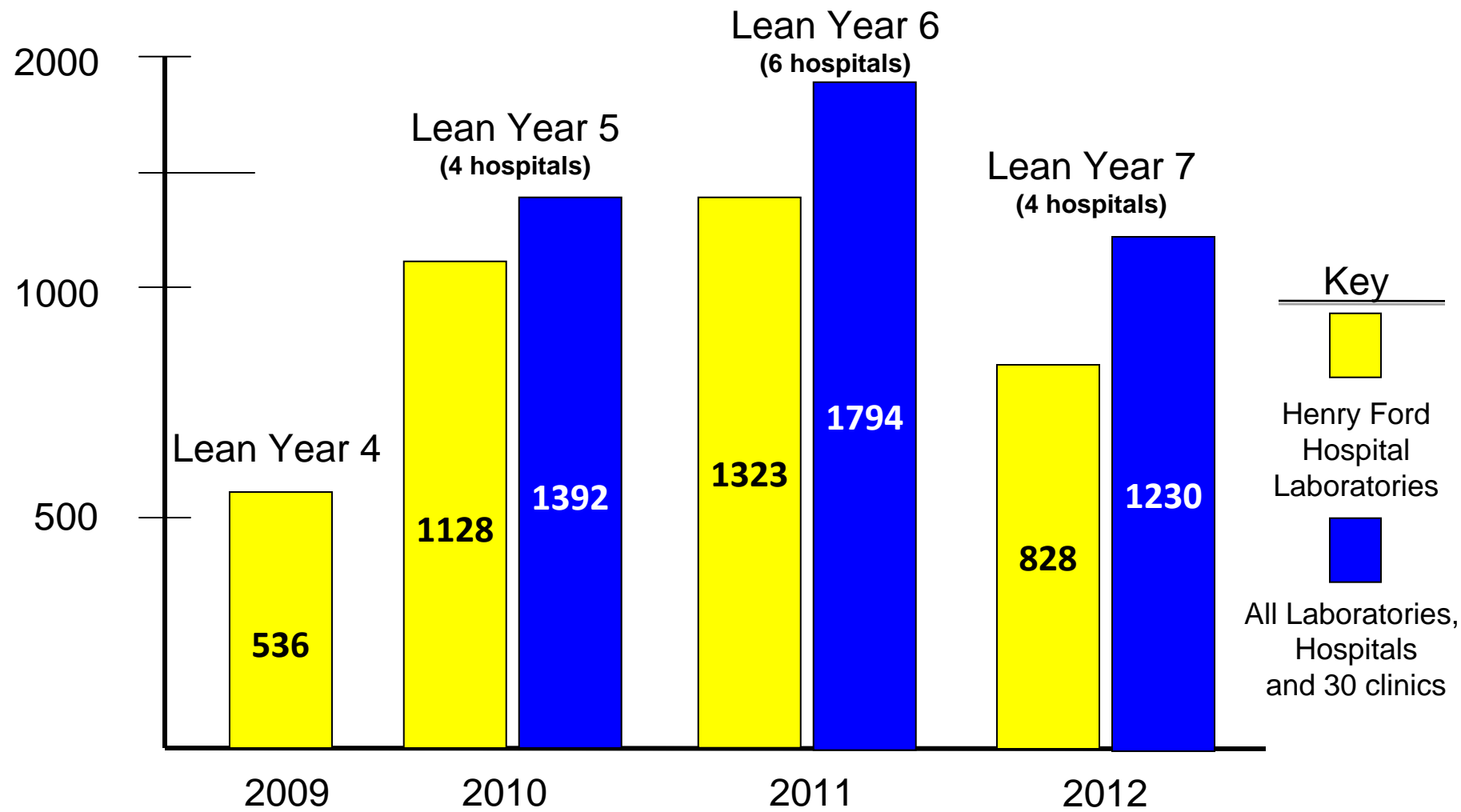
**89%**



**Empowered  
Work Teams**

# Total Process Improvements Pathology & Laboratory Medicine Service Line

*Henry Ford Production System*

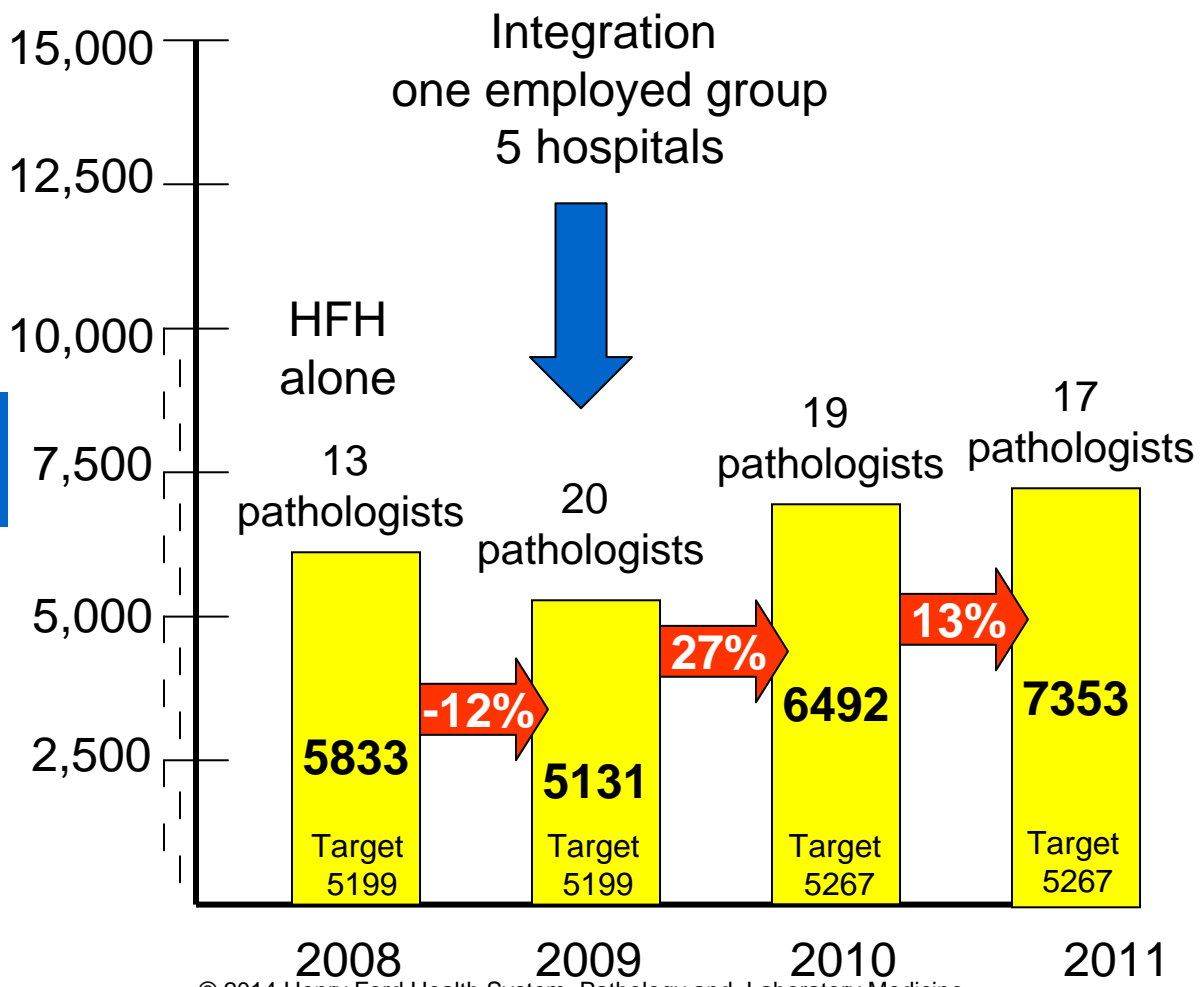


**Productivity**

# wRVU Anatomic Pathologists

## Pathology & Laboratory Medicine Service Line

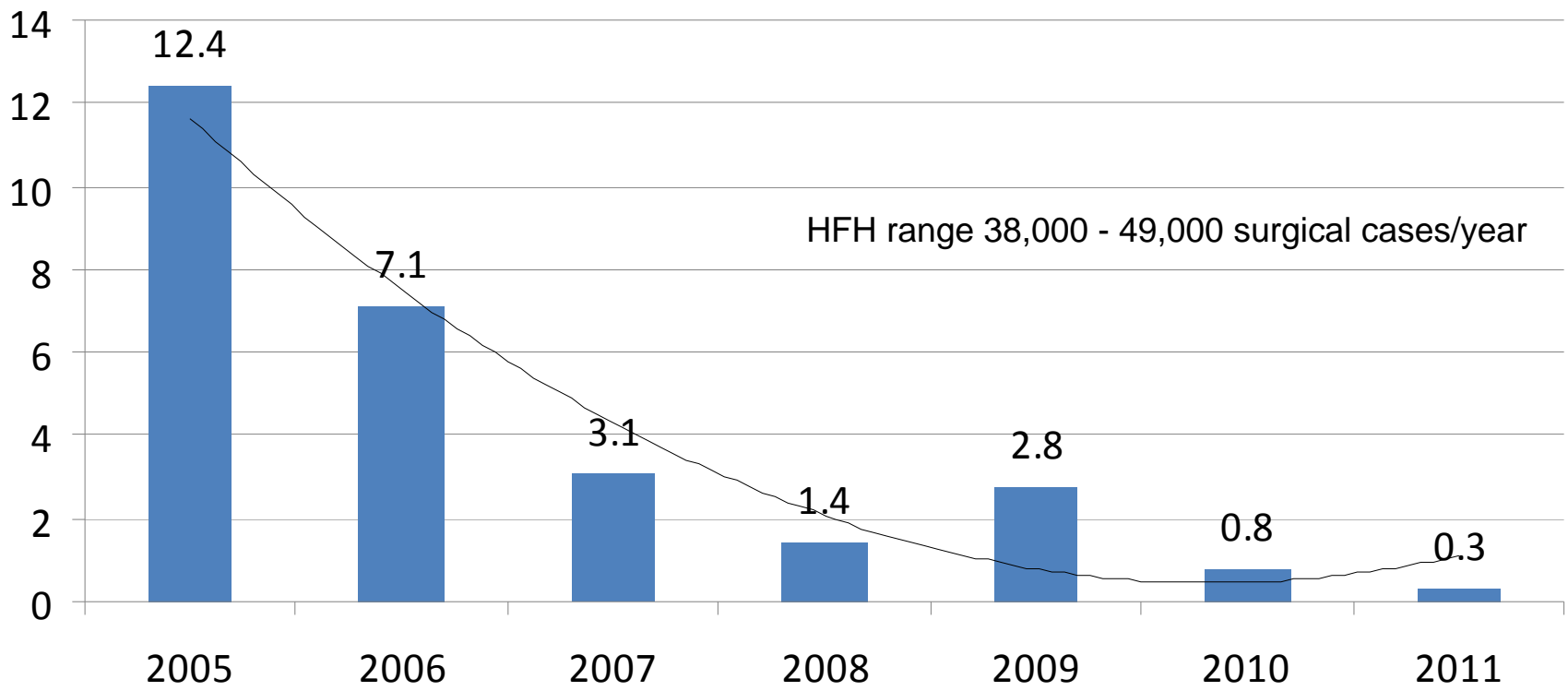
**Avg. RVU/FTE**



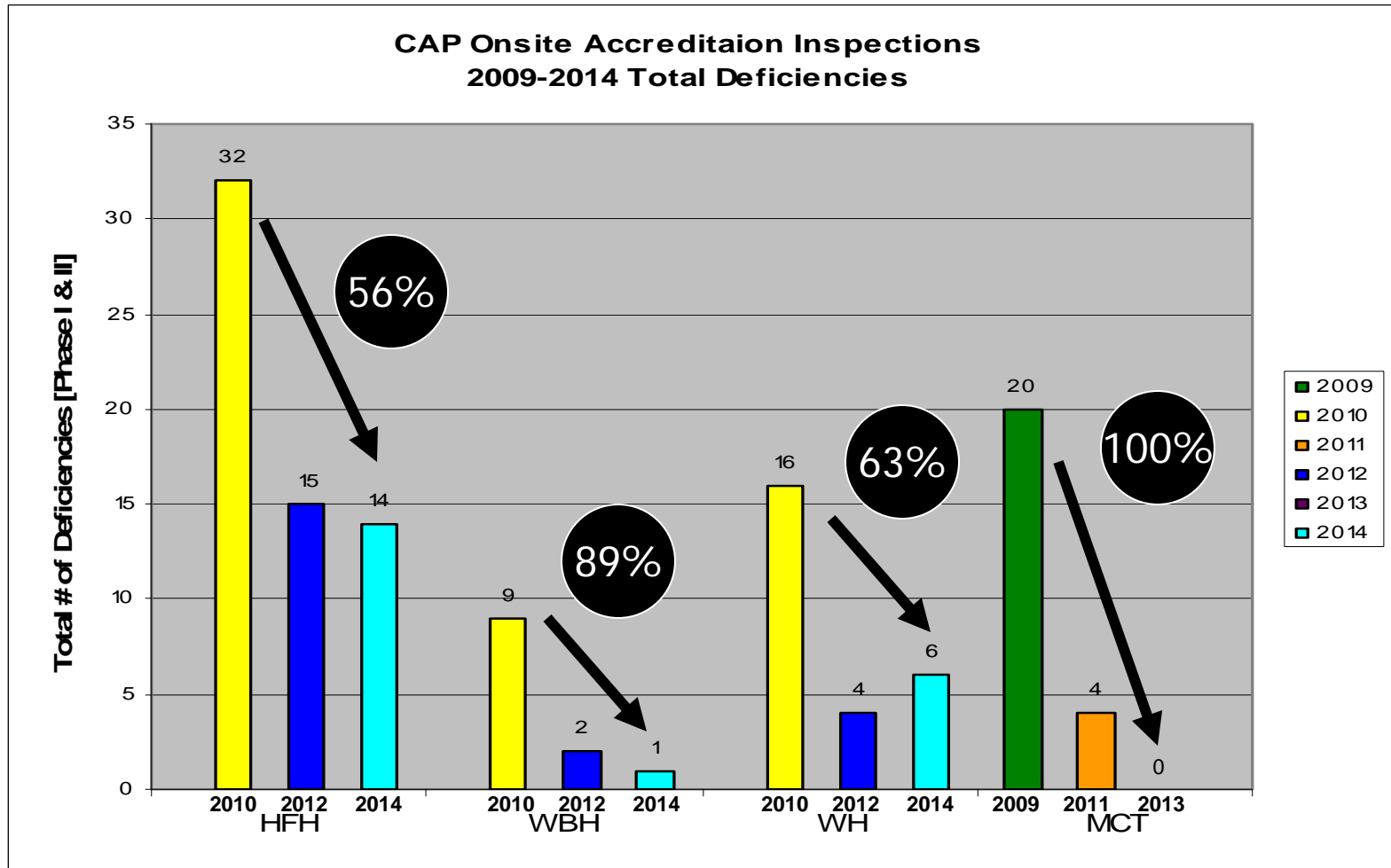
**Patient  
Safety**

# Reduction in Pathologist Mis-Interpretations

## Amended Reports per 10,000 cases



# CAP Inspection Deficiencies Henry Ford Hospitals





# Employee Engagement

Gallup Q<sup>12</sup> Survey

12 items  
Max score 5

**GrandMean (of all 12 items)**

**Overall satisfaction**

**I know what is expected of me at work**

**I have the materials & equipment I need to do my work right**

**At work I have the opportunity to do what I do best everyday**

**In the last 7 days, I have received recognition or praise for doing good work**

**My supervisor or someone at work, seems to care about me as a person**

**There is someone at work who encourages my development**

**At work, my opinions seem to count**

**The mission or purpose of my company makes me feel my job is important**

**My associates or fellow employees are committed to doing quality work**

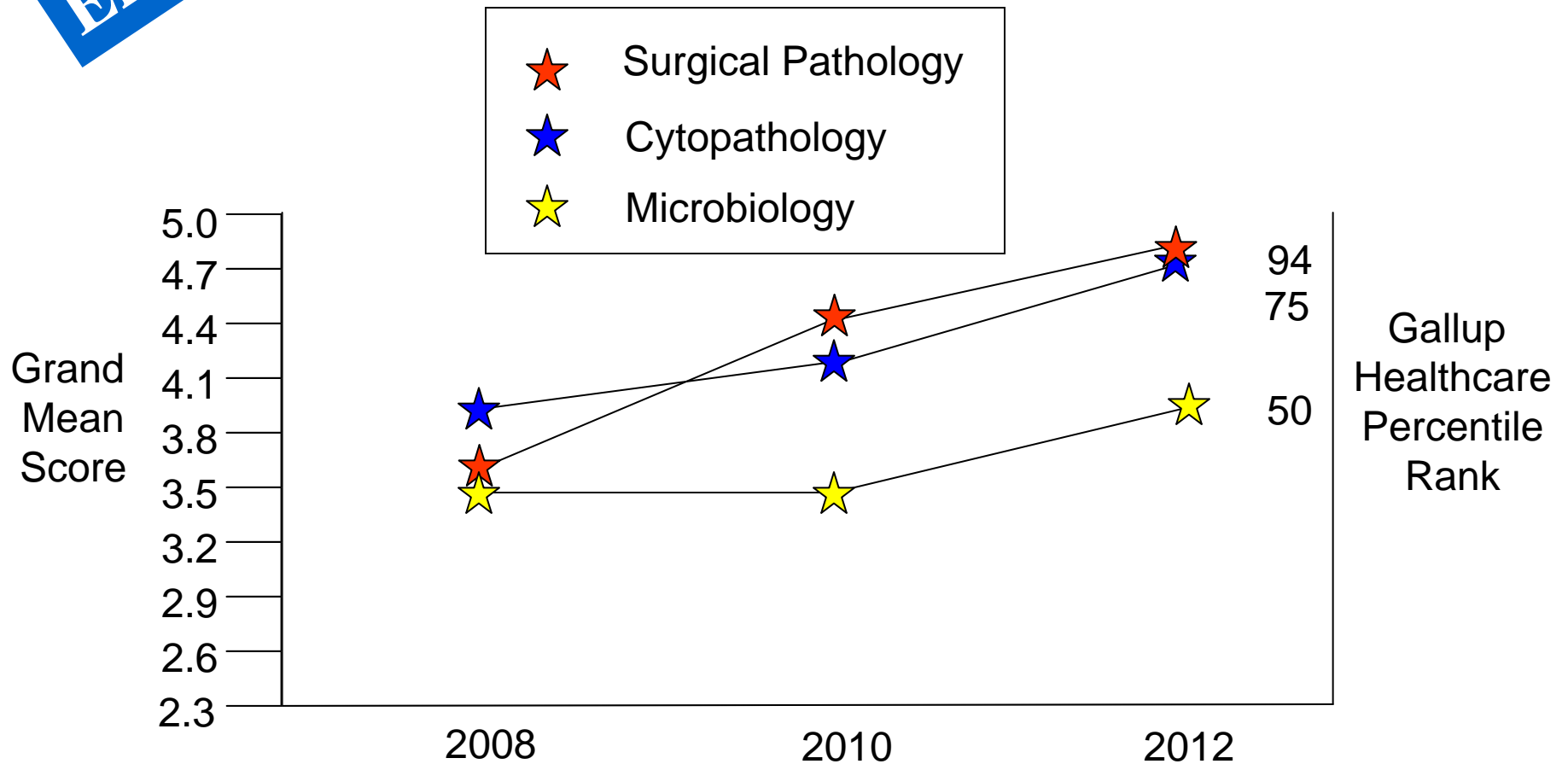
**I have a best friend at work**

**In the last 6 months, someone at work has talked to me about my progress**

**This last year, I have had opportunities to learn and grow**

# Employee Engagement

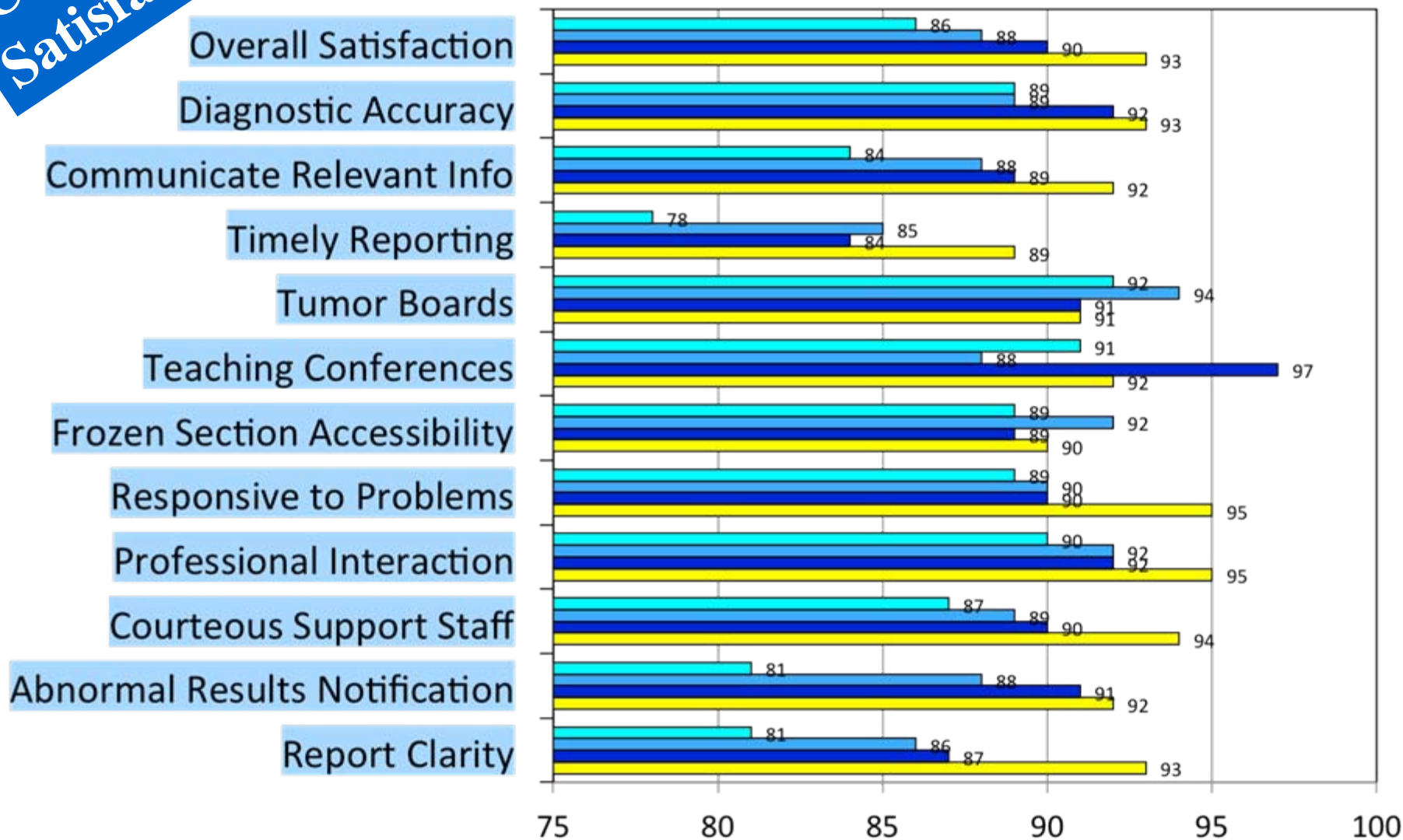
## Gallup Q12 Surveys 2008 vs 2010 vs 2012 Grand Mean Performance Trend in Employee Engagement Surveys



# Customer Satisfaction

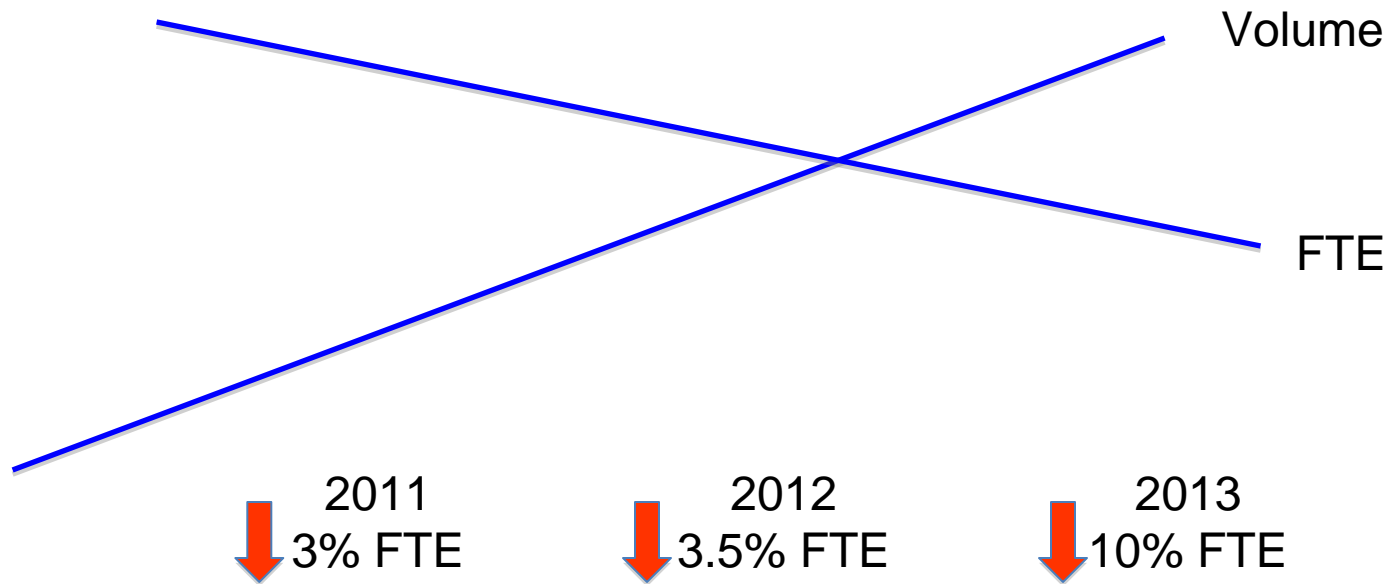
## Anatomic Pathology Clinician Satisfaction

### Percent Favorable Score

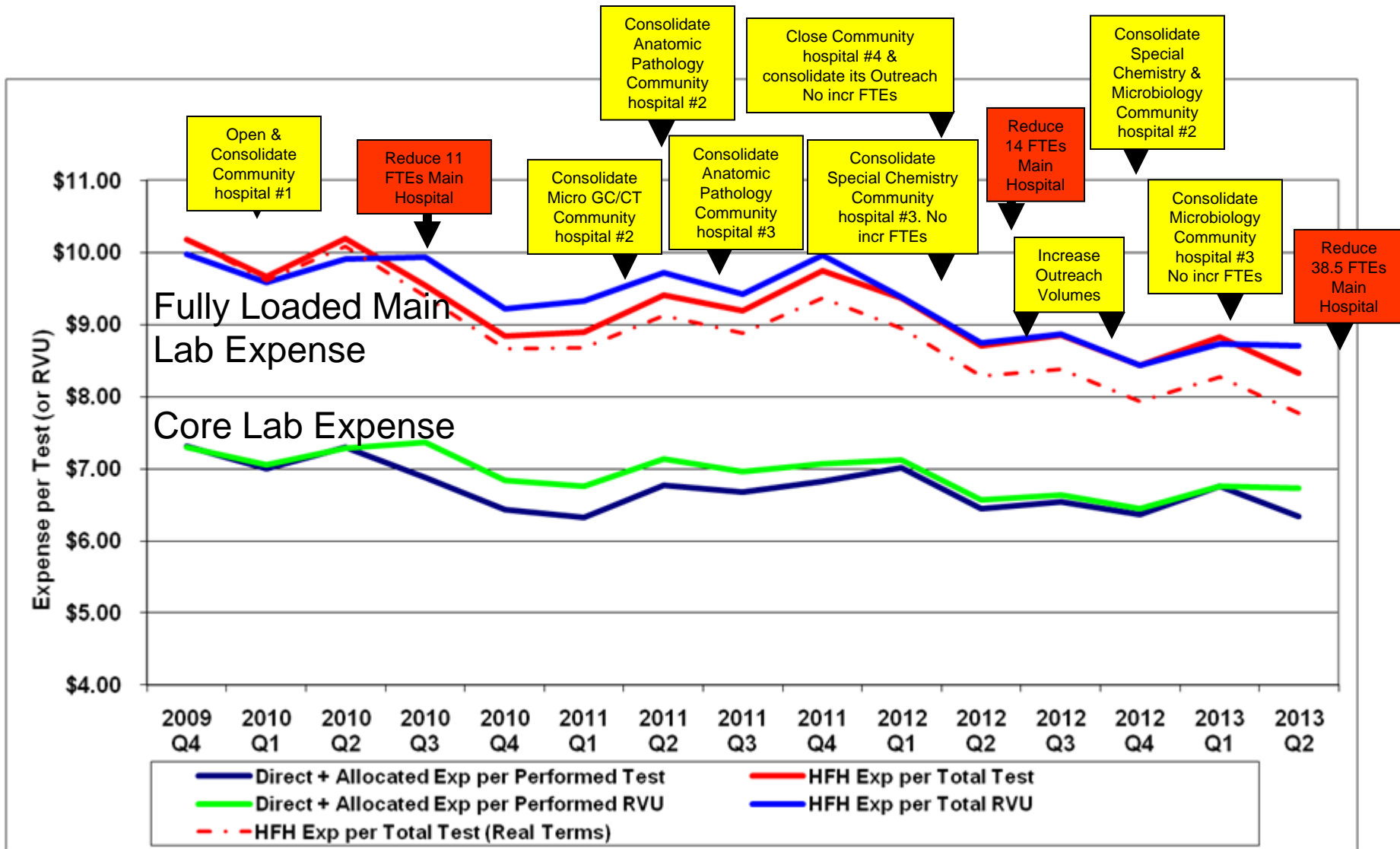


2005 2007 2009 2011

# Challenge



# Main Hosp & Core Lab Unit Cost Trends



LEAN is

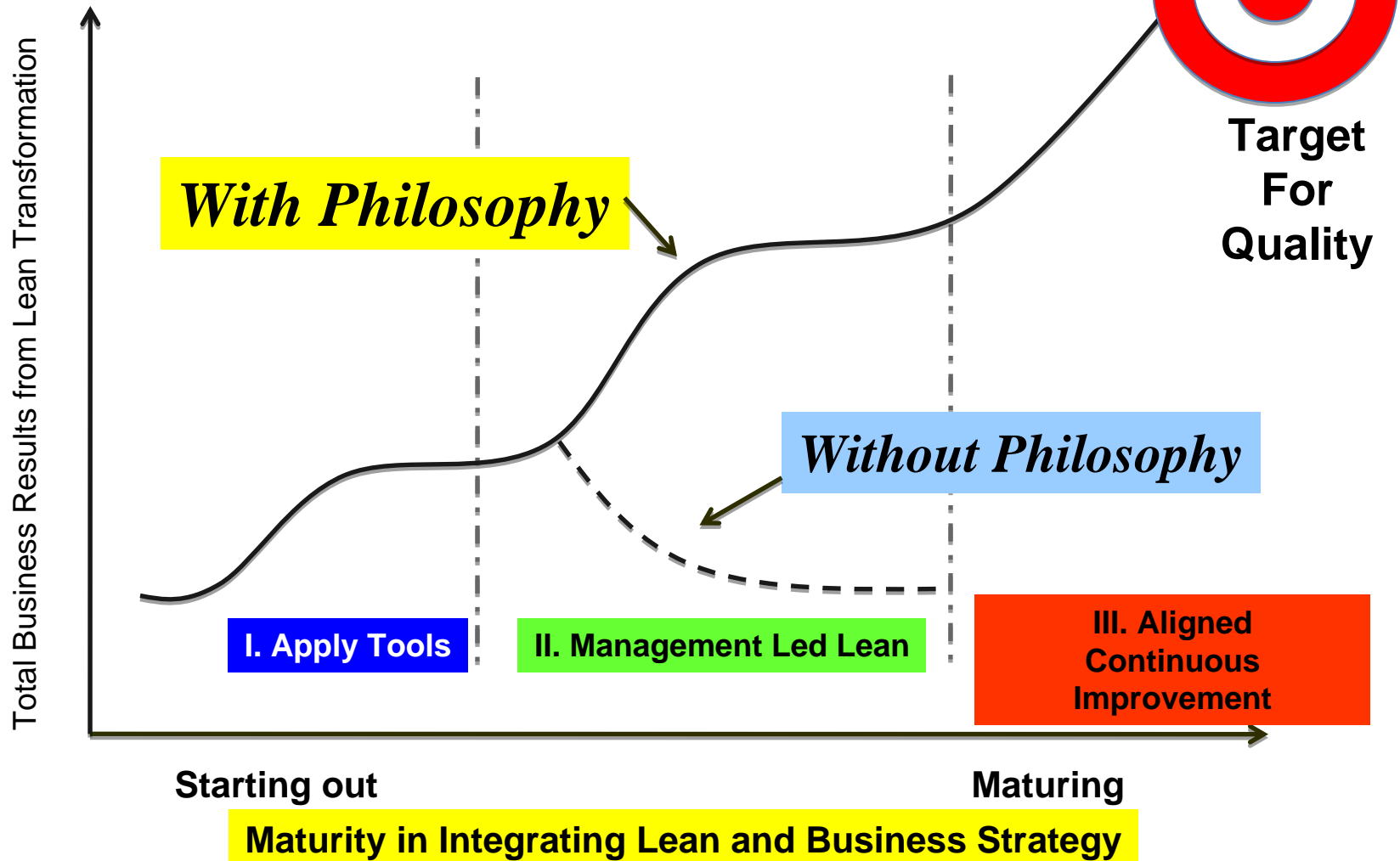
SLOW

So you can get

*FAST*

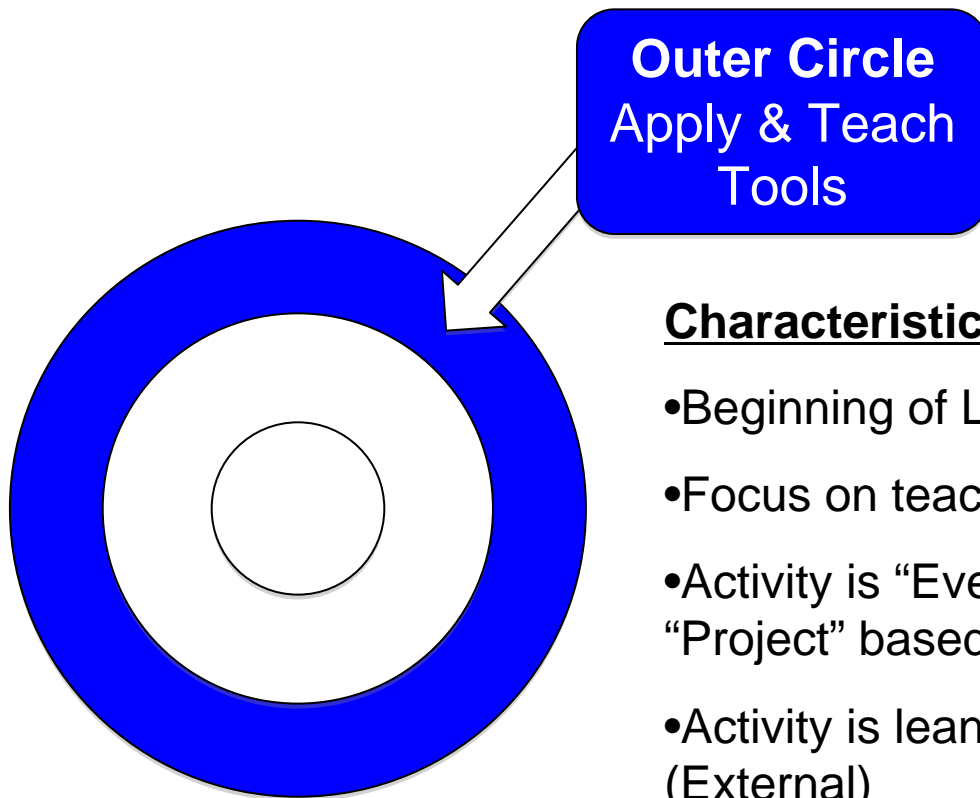
# Manage Toward the Goal

Results as Lean Evolves to Aligned Continuous Improvement



From The Toyota Way to Continuous Improvement by Liker & Franz

# Lean Deployment Phase I – Applying & Teaching 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

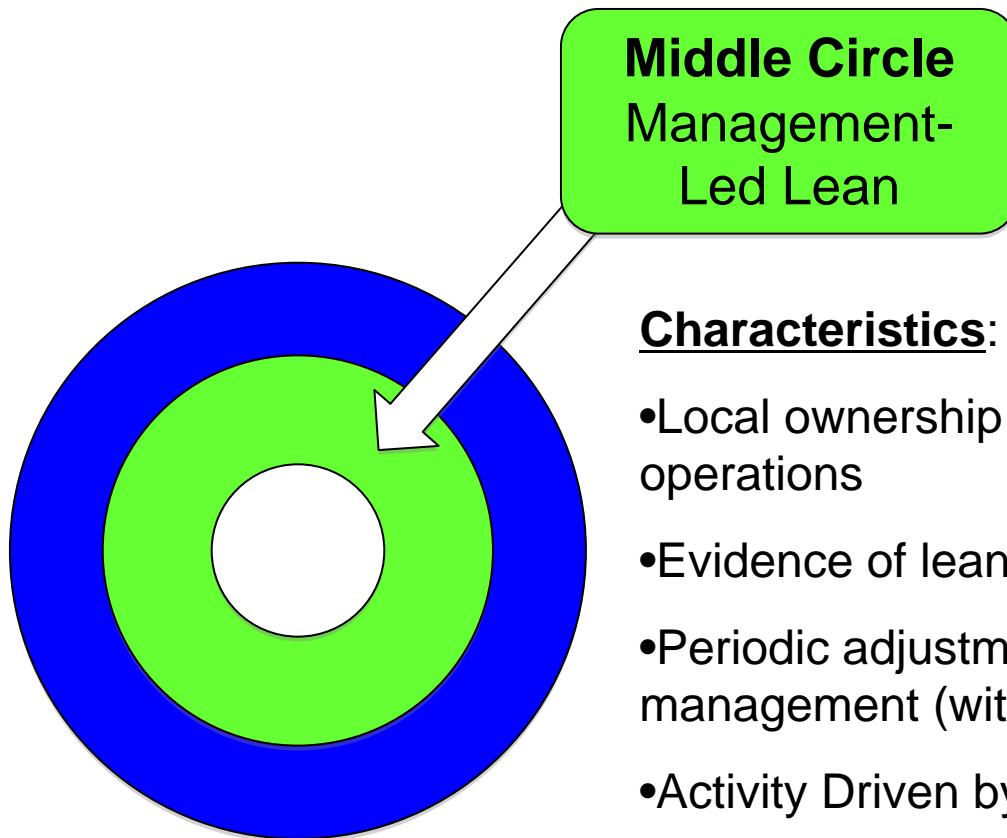


**Warning: This phase by itself is not self sustaining.  
Entropy Will Set in Degrading to a Lean Facade!**

Modified version of figure by David Meier. From [The Toyota Way to Continuous Improvement](#) by Liker & Franz



# Lean Deployment Phase II – Management-Led Lean



## Middle Circle Management- Led Lean

### Characteristics:

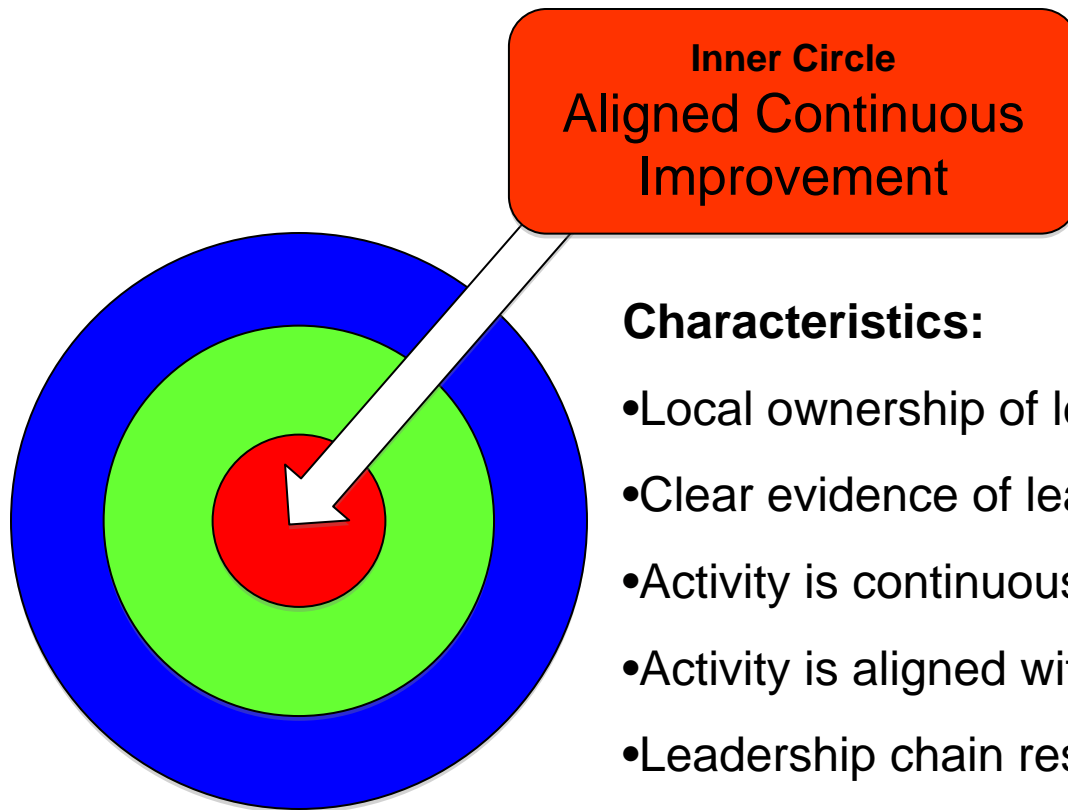
- Local ownership of lean by managers of the core operations
- Evidence of lean thinking in middle management
- Periodic adjustment by middle and senior management (with staff expert support)
- Activity Driven by local leader (takes responsibility)
- Focus: Involve Middle Managers in Improvement



**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



**All three layers  
are necessary!**

## Characteristics:

- Local ownership of lean by team members and leaders
- Clear evidence of lean thinking in work groups
- Activity is continuous (team & individual focus)
- Activity is aligned with business goals (hoshin kanri)
- Leadership chain responsible for kaizen & coach kaizen
- Focus: Achieve business goals while building Continuous improvement culture top to bottom



**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

© 2014 Henry Ford Health System, Pathology and Laboratory Medicine

# Quality as Teamwork



**The Best Team Wins!**

*-Danaher Business System*

# Failure Points in Lean Adoption

- **Poor leader commitment, engagement, support**
- **Poor communication of the vision**
- **Poor manager buy in and engagement of employees**
- **Lack of education and facilitation of employee involvement**
- **Lack of structure to enable people to work collaboratively**
- **Persistent silos of control or finance that preclude people from redesigning proper approaches to work**
- **Focus on just financial gain**
- **Persistence of a “blame” culture**
- **Fear of losing one’s job**
- **The usual resistance to change- make the case!**

# Key to Success in HFPS Lean Enterprise

- **Vision, dissatisfaction with status quo, set goals**
  - **Top down & bottom up pursuit zero defects**
  - **Aligned strategies and priorities**
- **Philosophy & Management System with Sub-systems**
  - **Continuous improvement, customer & shop floor focus, people development & empowerment & accountability**
- **Leaders & managers own it or fail**
- **Structure for team-driven change, collaboration**
- **Education and more education**
- **Targets, Metrics, PDCA-based change**
- **Deviation Management & Daily Management**
- **Meetings, all levels, horizontal management control**
- **Reinforcers- “Share the Gain”, performance appraisal**

# Take Home Messages

- Leadership commitment is key. Move beyond tools
- Create management systems and structures
- Communication, effective and often is required
- Empower the worker to voice ideas and develop improvements related to daily problems
- Customer-Supplier meetings to discuss requirements
- Create a Lean organizational structure so employees have structure to succeed in the new work expectation of continuously improving the work

# 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

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*