

# Supplier Presentation



## **M. Scott Crawford**

***Vice-President Financial and IT, Engineered Materials, Esterline Co.***

Scott Crawford has been associated with the Engineered Materials Group and Kirkhill-TA since 2006. He has been a CFO in the aerospace and defense industry for over 20 years. The Engineered Materials Group designs, develops, and manufactures high performance elastomer products for the aerospace, defense, and industrial markets. Operations include eight facilities including Kirkhill, TA Aerospace, Haskon Aerospace, and CSE. Kirkhill is the first SEA Stage-One Certified supplier and also the first to re-qualify that certification. Mr. Crawford earned his B.S. in Finance from Brigham Young University and his MBA from Arizona State University.



**In Memory of Steve Barton**  
*Friend, Colleague and Esteemed Leader*  
**1946 - 2009**



**Kirkhill – TA Co.**

Kirkhill Elastomers

Scott Crawford

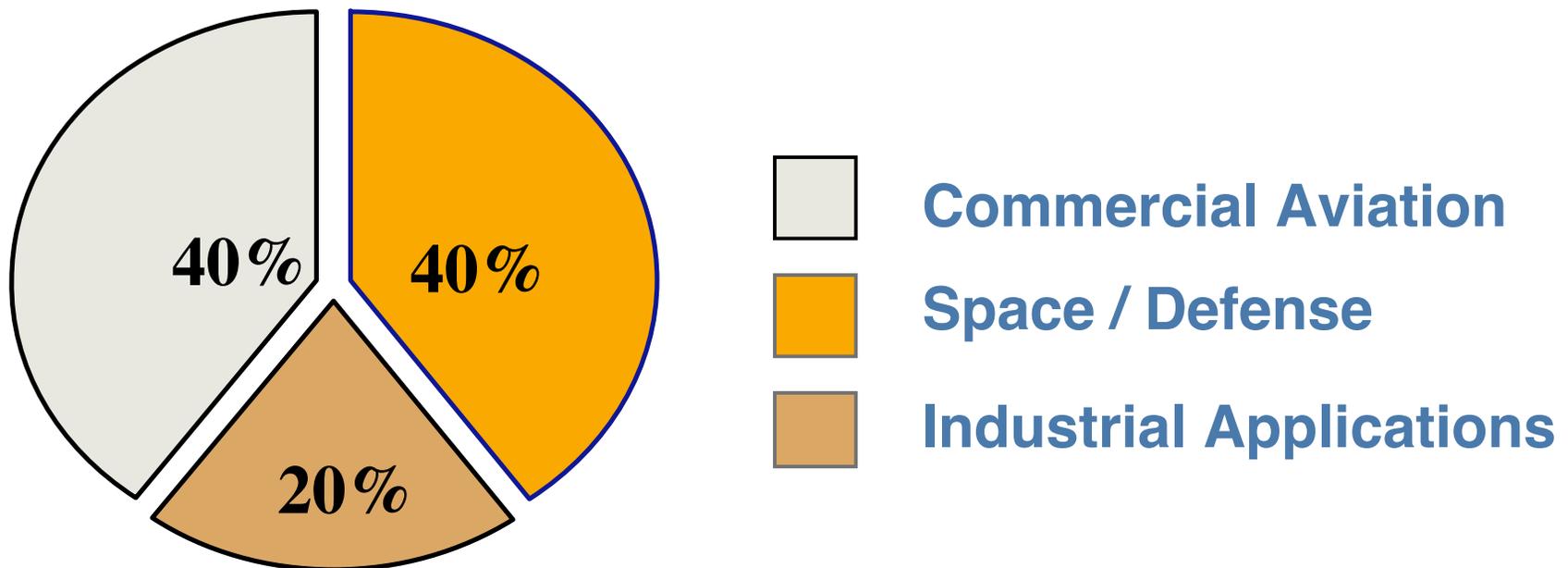
**SEA Lean Enterprise System**

# Prime Empowered .....Supplier Led



## Overview

- A specialized manufacturing company principally serving Aerospace / Defense
- NYSE listed since 1968 – “ESL”
- Sales revenue \$1.4B

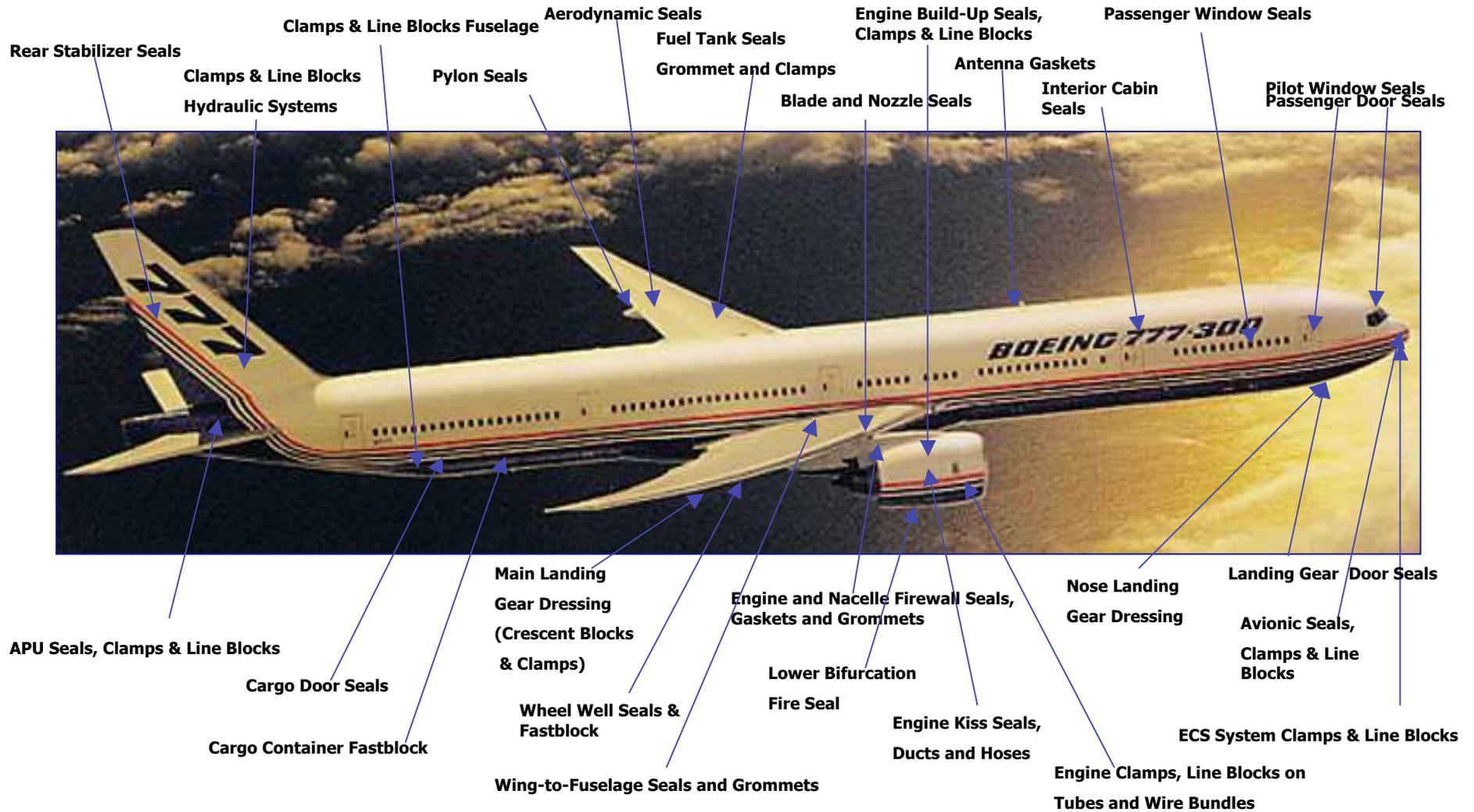


## Overview



# Engineered Materials Group

## Sealing & Clamping & Ducting



# **LEAN Journey– Big Undertaking**

## Waste Elimination



6 Full Time Lean Specialists plus 25 People 6-Sigma Certified GB & BB

# Historical Lean Timeline

- **Embarked on Lean with HLS** February 2005
- **Engaged with SEA** October 2005
- **SEA LES Training for Management** April 2006
- **SEA Roadmap Certifications (9 execs)** 2006 - 2007
- **SEA Managing Process Improvement** August 2007
- **SEA Audit Stage 1** October 9-11 2007
- **SEA Certified Stage 1 Level 3 PMM** October 12, 2007
- **SEA Re-Certified Stage 1 Level 3 PMM** January 2009
- **TA Aerospace – Sister Company – SEA Certified** January 2009

# Kirkhill-TA Lean Journey

	<u>FY2004</u>	<u>FY2008</u>	
• Sales Revenue	\$100M	\$154M	54% Growth!
• Sales/ee	\$84K	\$125K	49% Improvement!
• Inventory Turns	3.4	4.2	24% Improvement!
• On time Delivery	39%	81%	100+% Gain!
• AR Days	59	49	30% Gain!
• Quality PPM's	28,948	10,776	62% Improvement!
• Floor Space Savings	33,600 Ft2		Needed Space !!
• Financial Results			Greatly Improved !!

# 2009 KIRKHILL-TA



FLIGHT PLAN	FY05	FY06	FY07	FY08	FY09	
	Actual	Actual	Actual	Actual	Plan	Key Actions
<b>ROI % Increase</b>	xxx	xxx	xxx	xxx	xxx	<ol style="list-style-type: none"> <li>1. Mexico Startup</li> <li>2. Reduced inventory</li> <li>3. Reduce AR</li> </ol>
<b>PROFITABILITY</b> Sales growth Earnings growth	19% xxx	9% xxx	13% xxx	6% xxx	2% Xxx	<ol style="list-style-type: none"> <li>1. Expand global market share</li> <li>2. Improve dev. &amp; launch processes</li> <li>3. Scrap reduction thru six sigma</li> </ol>
<b>LEAN</b> Inv Turns Sales per ee	3.8 99K	4.0 105K	4.0 110K	4.2 125K	4.6 125K	<ol style="list-style-type: none"> <li>1. Implement TPS/HLS/PES</li> <li>2. Lean enterprise company wide</li> <li>3. Adopt SEA Phase I-II-III, PMM 3+</li> </ol>
<b>DELIVERY</b> Line Items	61%	68%	77%	85%	90%	<ol style="list-style-type: none"> <li>1. PC&amp;L with level loading</li> <li>2. Involve key suppliers in Lean VSM</li> <li>3. Expand VSM's to include customers</li> </ol>
<b>QUALITY</b> PPM's	22,100	21,350	16,800	10,776	<10,000	<ol style="list-style-type: none"> <li>1. Move inspection Resp. to Ops</li> <li>2. Expand use of 6-Sigma processes</li> <li>3. Continue equipment modernization</li> </ol>
<b>EMPLOYEES</b> Training Hrs Per EE Safety IFR	ETP- 60% 5.9%	ETP- 60% 5.9%	ETP- 80% 5.5%	ETP- 80% 5.4%	40-H 100-M <5.0	<ol style="list-style-type: none"> <li>1. Obtain a 4<sup>th</sup> State training grant</li> <li>2. Revise and update safety programs</li> <li>3. Increase training hours per ee</li> <li>4. Maintain high communications</li> </ol>

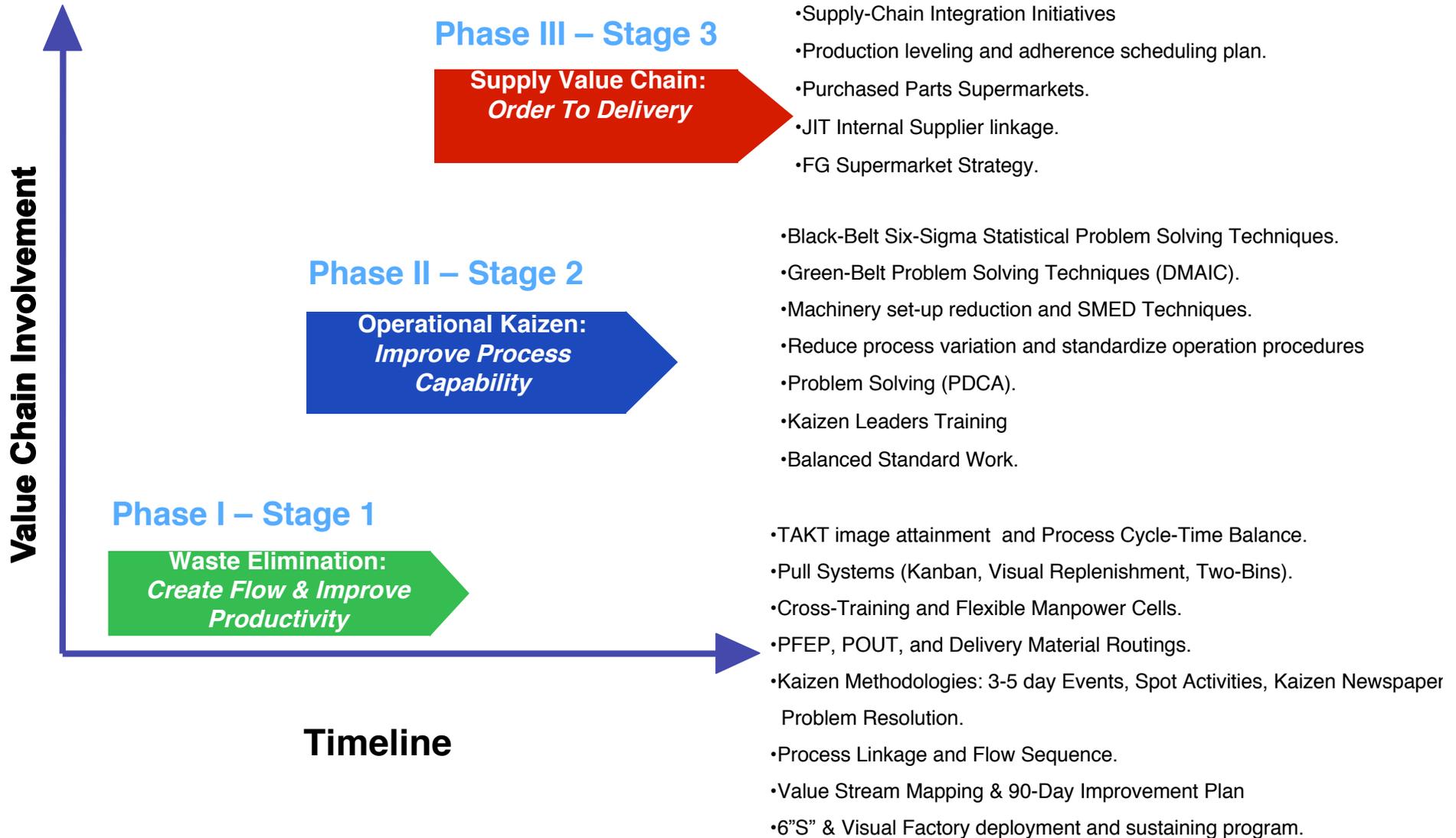
# SEA Roadmap

	<b>Stage One</b> Stabilization	<b>Stage Two</b> Supply Chain Integration	<b>Stage Three</b> Sustainability
<b>Leadership &amp; Culture</b>	1.1.1 Strategic Planning Process 1.1.2 Leadership Communication Process 1.1.3 Organizational Performance Review Process 1.1.4 Continuous Improvement Management Process 1.1.5 Workforce Development Integration Process	1.2.1 Goals Deployment & Review Process 1.2.2 Values Deployment Process 1.2.3 Supply Chain Integration Process	1.3.1 Organizational Learning Process 1.3.2 Organizational Assessment Process
<b>Workforce Development</b>	2.1.1 Job Skills & Cross-Training Certification Process	2.2.1 Continuous Improvement Process 2.2.2 Statistical Methods Process	2.3.1 Team Control Process
<b>Operational Excellence</b>	3.1.1 Kaizen Process 3.1.2 6S Visual Workplace Process 3.1.3 Quick Changeover/SMED Process 3.1.4 Material Management Process 3.1.5 Production Planning Process	3.2.1 Flow-Based Material Process 3.2.2 Mixed Model Cell/Line Design Process 3.2.3 Lean Suggestion Process 3.2.4 Total Productive Maintenance Process	3.3.1 Design of Experiments Process 3.3.2 Design to Cost Process 3.3.3 Six Sigma Projects Process 3.3.4 Six Sigma Design Process 3.3.5 Design for Manufacturability Process
<b>Business Results</b>	4.1.1 Inventory Turns 4.1.2 Sales/Employee 4.1.3 On-Time Delivery 4.1.4 Parts per Million 4.1.5 Process Maturity 3 and above	4.2.1 Cpk	4.3.1 Rolled Yield

**3 Tracks plus Business Results - L&C, WFD, OE**

**Stage 1 - 23 Key Business Processes to PMM Level 3**

# Lean Transformation 5-Year Plan



# Lean 5 Year Plan

Year 1	Duration	Plan
2005	Jan	Re-start Lean Journey
	Jan-May	Basic 6-S and Simple Kaizen focused on Waste
	Mar	Harris Lean Seminar, All Management
	Apr	Add 2nd Full Time Lean Engineer
	Apr-Dec	Supply Chain Systems for IC key Customers
	May-Curr	Formal sta
	Jun-Sep	AC Model
	May-Aug	Strategic F
	Sep	HLS Miles
	Oct-Curr	<b>KTA Joins</b>
	Oct	Add 3rd Fu
	Nov-Dec	SEA Asses
	Oct-Dec	Expand HL Start adop
	Jul-Dec	<b>ETP Train</b>
	Nov	TA Hires F

Year 2	Duration	Plan
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2006	Jan-Curr	<b>ETP traini</b>
	Jan	<b>G. Mancilla</b>
	Jan-Mar	AC SM-MC
		IC Molding
		DP - Basic
		Start Admi
		Initiate Adt
	Mar	HLS Semii
	Mar	<b>S. Lauten</b>
	APR	<b>Sr. Manag</b>
		First (2 - K
	Apr-Aug	Strategic F
	Apr-Sep	AC and CS
		AC PC&L
		IC Molding
		Establish E
		Doc Contr

Year 3	Duration	Plan
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2007	Jan	Executive Lean Audit Av
	Feb	Add 4th Full Time Lean
	Jan-Mar	Develop Standard PFEF
		Initiate Formal Site Plan
		ATK PES with S&M Kai
		Standard Glass Walls to
		Develop Finished Good
	Jan-Jun	<b>ETP Training Ongoing</b>
	Jan-Sep	Completed Current Stat
	Mar	<b>H. Rubio, K. Fisher, S. SEA Self-Assessment</b>
	Mar	HLS Seminar and Lean
	Feb-Jul	Add Duct, Inflatables in
	Apr-Jun	Develop Lean AC Engin
	Apr-Aug	<b>Strategic Planning Pro</b>
	Apr-Oct	Completed Future State
	Apr-Dec	Major Completion of PFI
		All Admin Areas Adopte
	Feb - end	Train Leaders in Six Sig
		Train Selected Addition
	Mar-Jun	Add 2 Additional Full Tir
		<b>G. Mancilla SEA certifi</b>
		Formalize Master Traine
		Implement Internal Lear
		<b>LS Managing Process</b>
	Mar- Sep	<b>Correct SEA Gap Anal</b>

Year 4	Duration	Plan
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2008	Jan-Oct	<b>KE SEA Stage</b>
		<b>KE SEA Stage</b>
		Launch Mexico
		Implement Site
		Implement PFE
		Expand Lean E
		Integrate Lean
	Mar	HLS Seminar &
		Expand Lean E
		Expand Green
		Implement Desi
	May	Launch Strateg
	Apr-Aug	Expand Skill Be
		Model Line Cor
		Haskon & TA G
		<b>Haskon to SEA</b>
	Aug	2 Day leadershi
	Sep	HLS Seminar &
		TA SEA Stage I
		TA SEA Stage I
	Nov	Roll Out 2009 S

Recognition & Rewards System for Hourly Leads  
TA Completes Initial Skill Based Pay Implementation  
HLS Seminar and Lean Review  
**Pursue Next ETP Funding Grant**

Sep		
Oct		<b>SEA Certificati</b>
Oct-Nov		Correct any SE
Oct-Dec		TA at SEA Stag
Nov		Roll out 2008 S
Dec		All major KE are

Year 5	Duration	Plan
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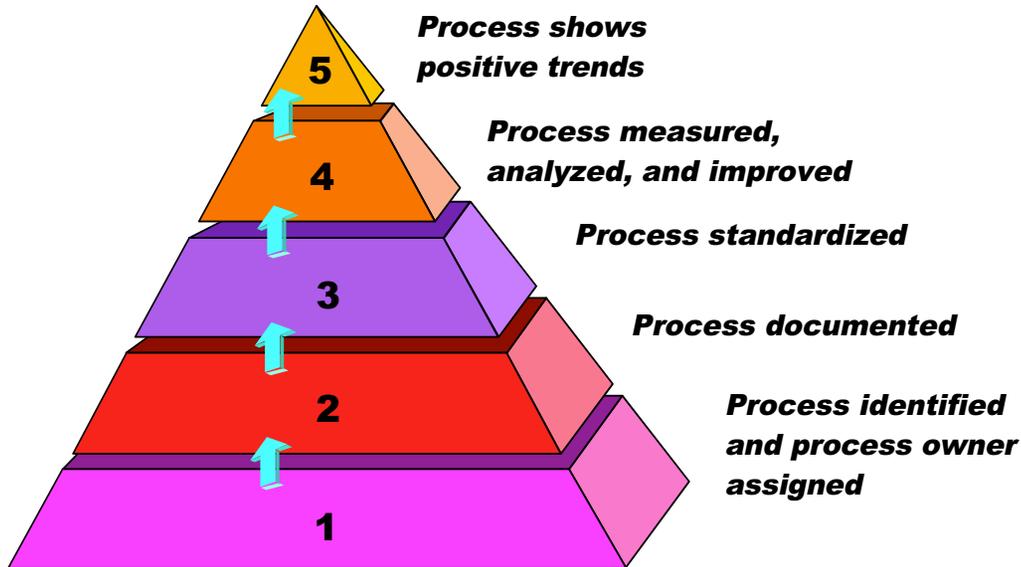
2009	Jan-Oct	<b>KE SEA Stage III Activities at PMM level 3</b>
		Expand Green & Black Belt Six Sigma P programs
	Mar	HLS Seminar & Lean Review
	May	Launch Strategic Planning Process
	Apr-Aug	Expand Lean Enterprise Efforts to Smaller Work Cells
		Complete Significant Lean Enterprise Adoption in All Admin Areas
		Integrate Shipping, Warehouse, and Material Movement For Both Sites
		Apply Lean Best Practices Across EMG
		Strategic Planning process
		<b>Haskon at SEA Stage I with PMM level 3</b>
		<b>Haskon at SEA Stage II with PMM level 1</b>
	Sep	HLS Seminar & Lean Review
		<b>TA SEA Stage I Activities With Process Maturity Level 4</b>
		<b>TA SEA Stage II Activities at Process Maturity Level 3</b>
		<b>TA SEA Stage III Activities at Process Maturity Level 1</b>
	Nov	Roll out 2010 Strategy, Plans, Budget

Year 6	Duration	Plan
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2010	Jan-Oct	KE & TA with all Stages at PMM Level 3
		KE & TA with Stage 1 Processes at Level 4
		HA with Stage 1 & 2 at Level 3 and Stage 3 at Level 1PMM
		Lean Enterprise Wide at all Locations
		Expanded Use of 6-Sigma in All Areas
	Mar	HLS Review and Seminar
	May	Launch Strategic Planning Process
	Apr-Aug	Lean from Supplier to Customer - Full Value Stream s
		Benchmarking Wide Spread in Key Processes
	Sep	HA with PMM Level 3 for All Stages in SEA Roadmap
		TA Continued Progress Beyond Level 3 PMM
		KE Continued Progress Beyond Level 3 PMM
		HLS Review and Seminar
	Nov	Roll Out Strategic Plans, Budgets and 2011 Plans

# Process Maturity Matrix

## The Process Maturity Model



KE Process Maturity Goal:  
SEA Roadmap Stage 2  
Processes at Level 3  
by April 2009

Lean Enterprise System	5.2.0 Managed Processes	Process Owner	Master Trainer	PMM	PMM
				2008	2009
5.2.1 Aircraft	5.2.1.1 Stock Prep Central	F. Serna	F. Serna	0.0	1.5
	5.2.1.2 AC Long Seal area	F. Serna	F. Serna	0.0	2.0
	5.2.1.3 Duct Department #101	J. De La Trir	F. Serna	0.0	2.0
5.2.2 IC / NPI Cells	5.2.2.1 IC Model Cell #226	M. Ibarra	S. Menold	0.0	2.5
	5.2.2.2 Sonaca Model cell	L. Kapahua	S. Menold	0.0	2.5

# SEA Roadmap

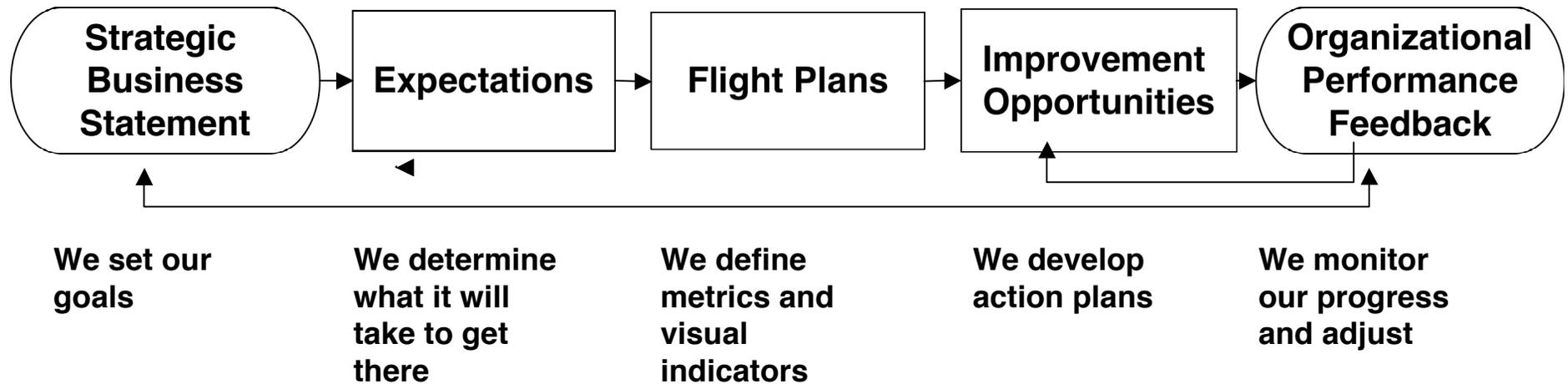
## Stage 2 Leadership & Culture

<b>Stage 2 Leadership &amp; Culture</b>					
	<b>Champion : President &amp; CEO</b>	<b>Stabilization</b>			
	<b>Process</b>	<b>Process Owner</b>	<b>Master Trainer</b>	<b>PMM 2008</b>	<b>PMM 2009</b>
<b>1.2.1</b>	<b>Goals Deployment &amp; Review</b>	VP Finance	VP Finance	<b>3</b>	<b>3</b>
	<b>Process</b>				
<b>1.2.2</b>	<b>Values Deployment Process</b>	COO	VP HR	<b>2</b>	<b>3</b>
<b>1.2.3</b>	<b>Supply Chain Integration</b>	Dir Purch	Dir Purch	<b>2</b>	<b>3</b>

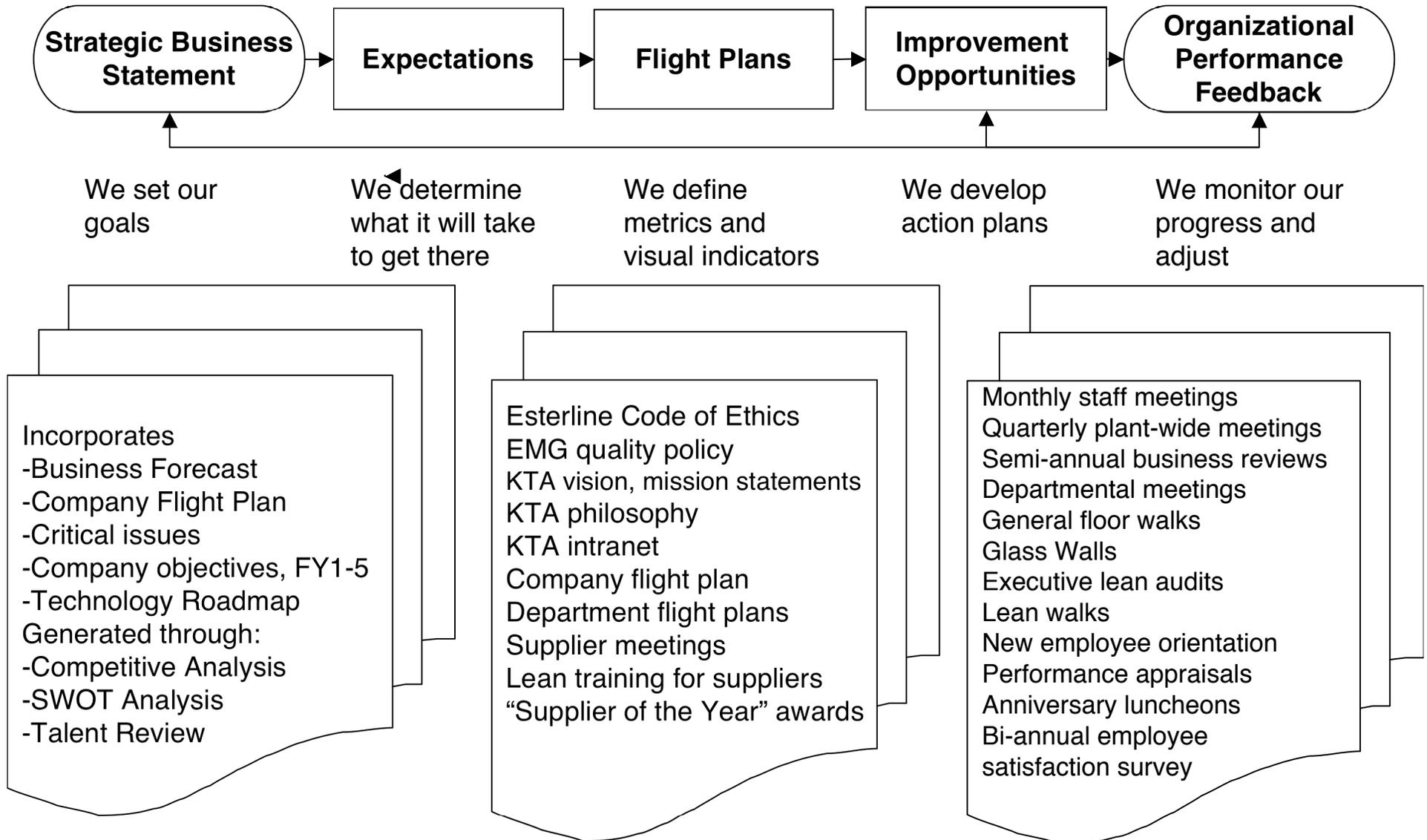
**Six Executives SEA Certified in Lean Leadership**

# Building a Culture of Improvement

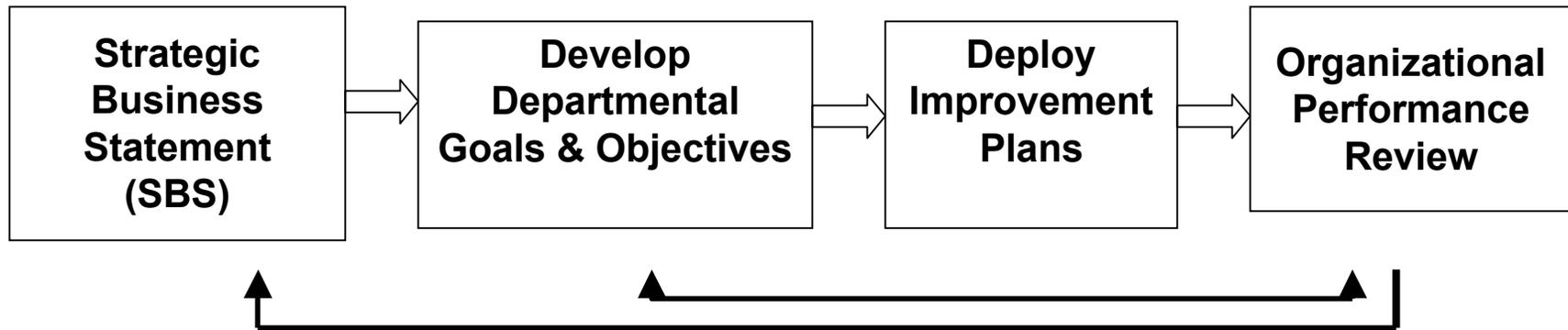
## - *Leadership & Culture*



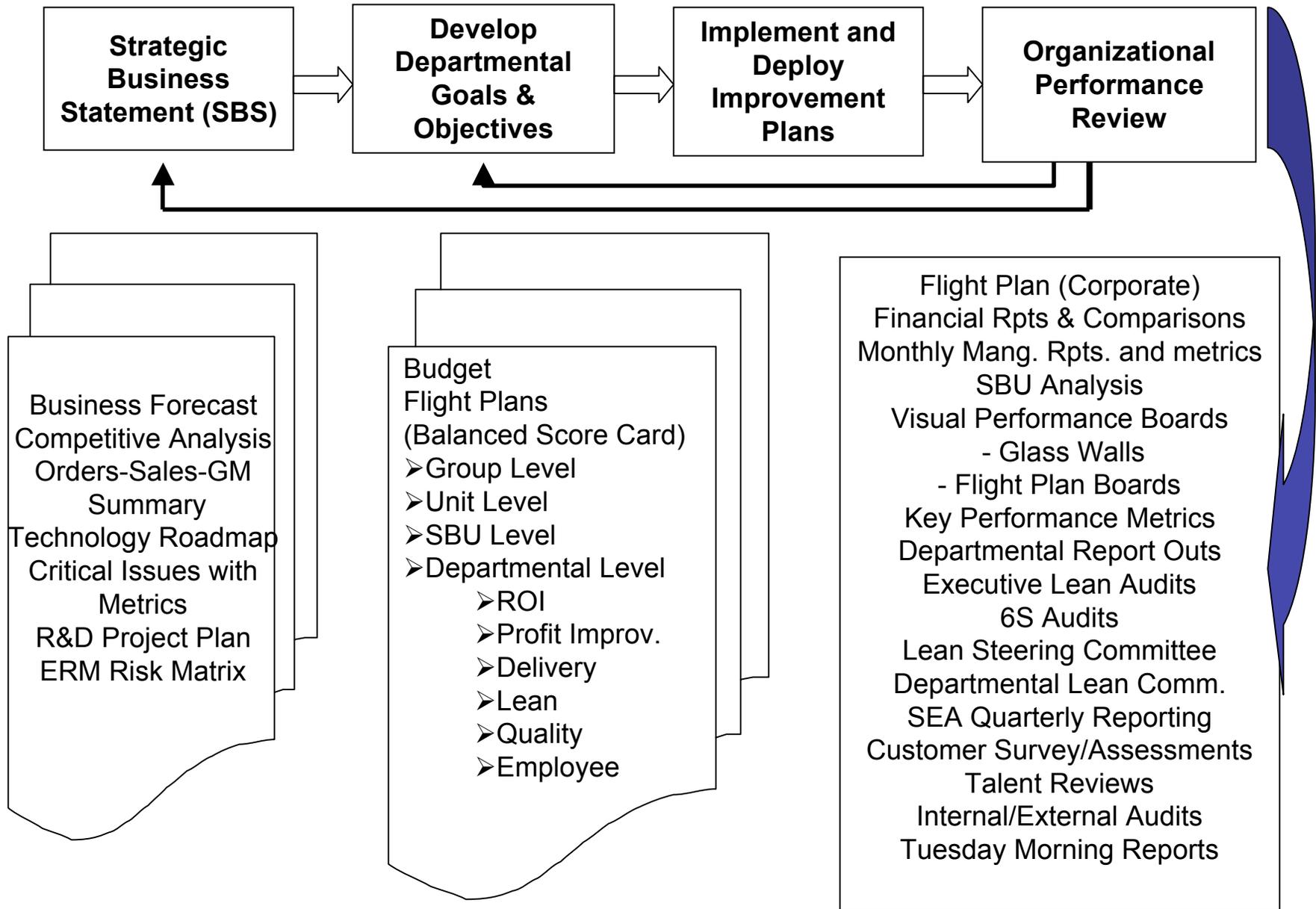
# Building a Culture of Improvement



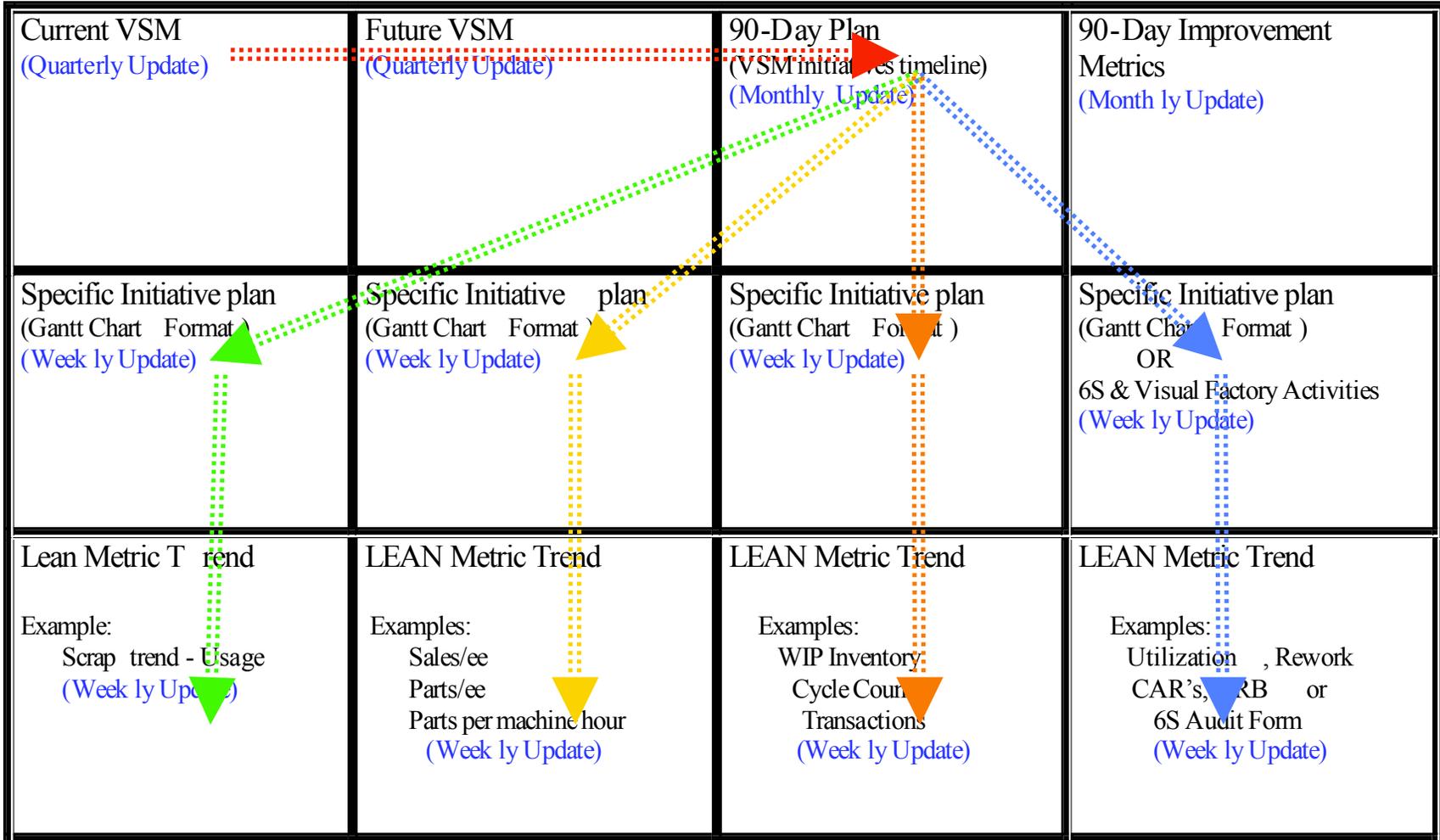
# Organizational Performance Review System *- Sustainment*



# Organizational Performance Review System



## Glass Wall Board Format



Bulletin Board details: 4' (W) X 3' (H) ..... (OfficeMax order no. J4B364T)  
 Horizontal Wall Mount Sign Holders, Landscape, 8" X 11" ....(Staples Item no. 665620)

# Glass Wall Metric Examples

	<u>ESL Metrics</u>	<u>Company Metrics</u>	<u>SBU Metrics</u>	<u>Mfg. Dept. Metrics</u>	<u>Support Metrics</u>
ROI	ROI	ROI pre-charge	GM %	Cost Metrics	Cost reductions
			Labor Effic %	Labor Effic %	Receivables/payables
			Inventory Levels	Inventory Levels	beat budget items
*PROFIT	% Profit Increase	Profit growth	% Scrap \$	% scrap \$	Eng., R&D costs
Growth	2008 vs 2007	Sales Growth	Variances to stds.	Sales prices up	Tooling costs
		Price Increases	Price Increases	Purchase price down	Oper. Supplies
			Expedite fees	Prem. Freight	Errors
			OH cost reduction	Equip. utilization	Overtime
				Overtime costs	Launch costs
LEAN	Sales per ee	Sales/ee	Sales/ee	parts per hour	Processing times
	Inventory turns	Inventory turns	Inventory Value	WIP inventory	Staffing levels
	Velocity	Thru-put times	Lead Times	Cycle counts	Cycle times/ <b>velocity</b>
		VSM times	WIP levels	Floor Space saved	Schedule compliance
		SEA PMM Levels	SEA PMM Levels	SEA PMM Levels	SEA PMM Levels
			Lean Implementation	Lean, 6-S Audits	PFEP's, 6-S Audits
Delivery	Delivery	\$ past Due	\$ past Due	\$ past Due	Lead times
		% Line Items on time	Line items on time	Line items on time	Order entry times
		Customer Satisfaction	Key customer ratings	Daily on time %	Development times
		Customer feedback	Surveys	Customer feedback	Response times
			Internal Cust. Feedback	Internal Cust. Feedback	Internal Cust. Feedback
Quality	returns % sales	\$ return % sales	\$ return % sales	\$ return % sales	Paperwork errors
	PPM's	% line item returns	% line item returns	% line item returns	Passed first articles
	DPMO	Rework costs	Rework costs	Rework costs	Survey results
		Customer Rpts	Survey results	Survey results	Supplier performance
		AS-9100 results		Audit compliance	Accuracy
Employee	NA	Training hrs per hourly	Training hrs per hourly	Training hrs per hourly	Training hrs per hourly
		Training hrs per salary	Training hrs per salary	Training hrs per salary	Training hrs per salary
Relations		Safety indexes	Safety indexes	No serious injuries	No recordable injuries
		Development Plans	Perf. Appraisals	Convert temps	Convert temps
		Turnover/Attendance	Retain key employees	Communications	Communications
		Recruitment	Recruitment	Skill Based Pay	Internal Promotions



# KIRKHILL TRAINING PLAN FY2009

## Flight Plan Initiatives Linked Training :

### ✓ Return on Investment:

- Flight Plans, Managing by Objectives
- Flight Plans, PDCA
- ManMan – BOM's, Routers, Work Orders, Xactman
- Inventory Management, Warehouse Procedures

### ✓ Profit Growth :

- Contract Review
- Customer Service Skills
- Regulatory Compliance Training
- Financial Reporting for Managers/Supervisors
- Six Sigma Problem Solving

### ✓ Lean Enterprise :

- 6-S, 6-S Audit Review
- Glass Wall & Visual Indicators, Visual Office
- Production Min-Max Supermarket,
- Value Stream Mapping, Kaizen
- Metrics, How to Develop & Use
- SEA LES, HLS Lean Basics, LET

### ✓ Delivery :

- Project Management
- Time Management
- Quick Change Over, SMED
- Kanban Systems

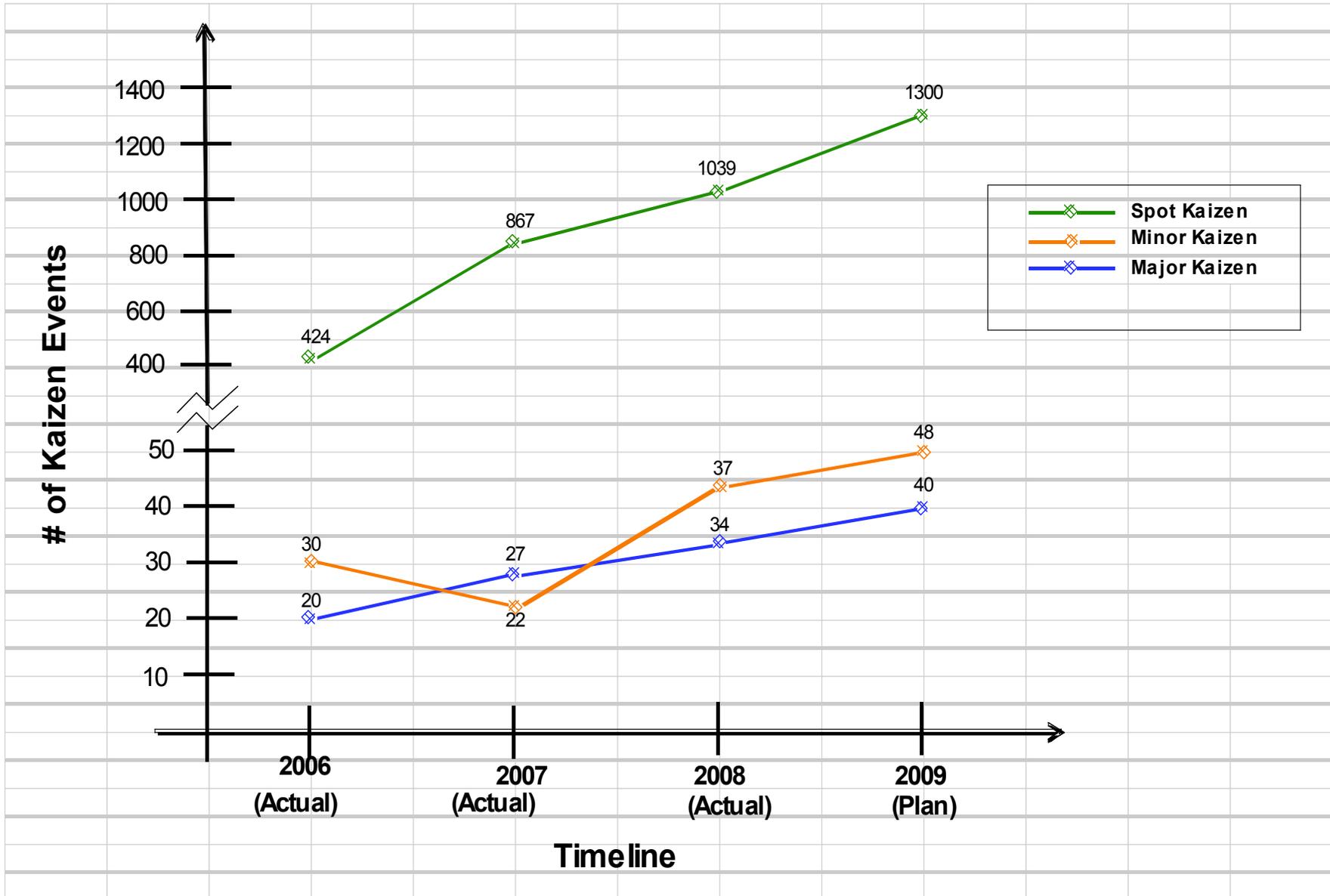
### ✓ Quality :

- AS 9100 – Introduction & Advanced
- Geometric Dimensions and Tolerancing
- Master Trainer training, Job Skills
- Problem Solving/Root Cause Analysis
- Quality System Training, Levels 1-4

### ✓ Employee Relations :

- Communication Skills, Leadership Skills
- Esterline Competencies – Individual Performer
- Esterline Competencies – Managerial Needs
- ESL Management Essentials
- Office Safety, Production Safety Topics
- Stress Management, Change Management

# KE Kaizen Events Log Chart



# Approach

- Worker creativity re-energized by designing and building a suitable work environment.

A place for everything and everything in it's place.



- ◆ Work is now being performed with attention to detail



### ***Brea Before***

The Small Line occupied a large area under-utilized for work and over utilized for the placement of WIP and other non-essential items

### ***Brea After***

As a direct result of the 5S activity, the entire Small Line was able to move closer to the next process; identification. This freed up over 400 sq. feet of space which allowed the department to move a related process to where it could feed into the next processes.



**Fabrication Cell Moved  
Due to Opened Up Floor Space**

# Lean Future Plans Overview

- **Strategic Planning Sessions** May - August - November
- **HLS Reviews & Seminars** March - September
- **SEA Stage 2 & 3 PMM level 3** Ongoing
- **Glass Wall Boards** 90 Day Plans
- **Plant-wide Meetings** Quarterly
- **Exec Lean Steering Committee** Monthly
- **Lean Executive Audits** Monthly
- **Flight Plan Reviews** Monthly
- **Kaizen Events** Daily / Weekly
- **6-S Area Audits** Weekly
- **Production Charting** Hourly

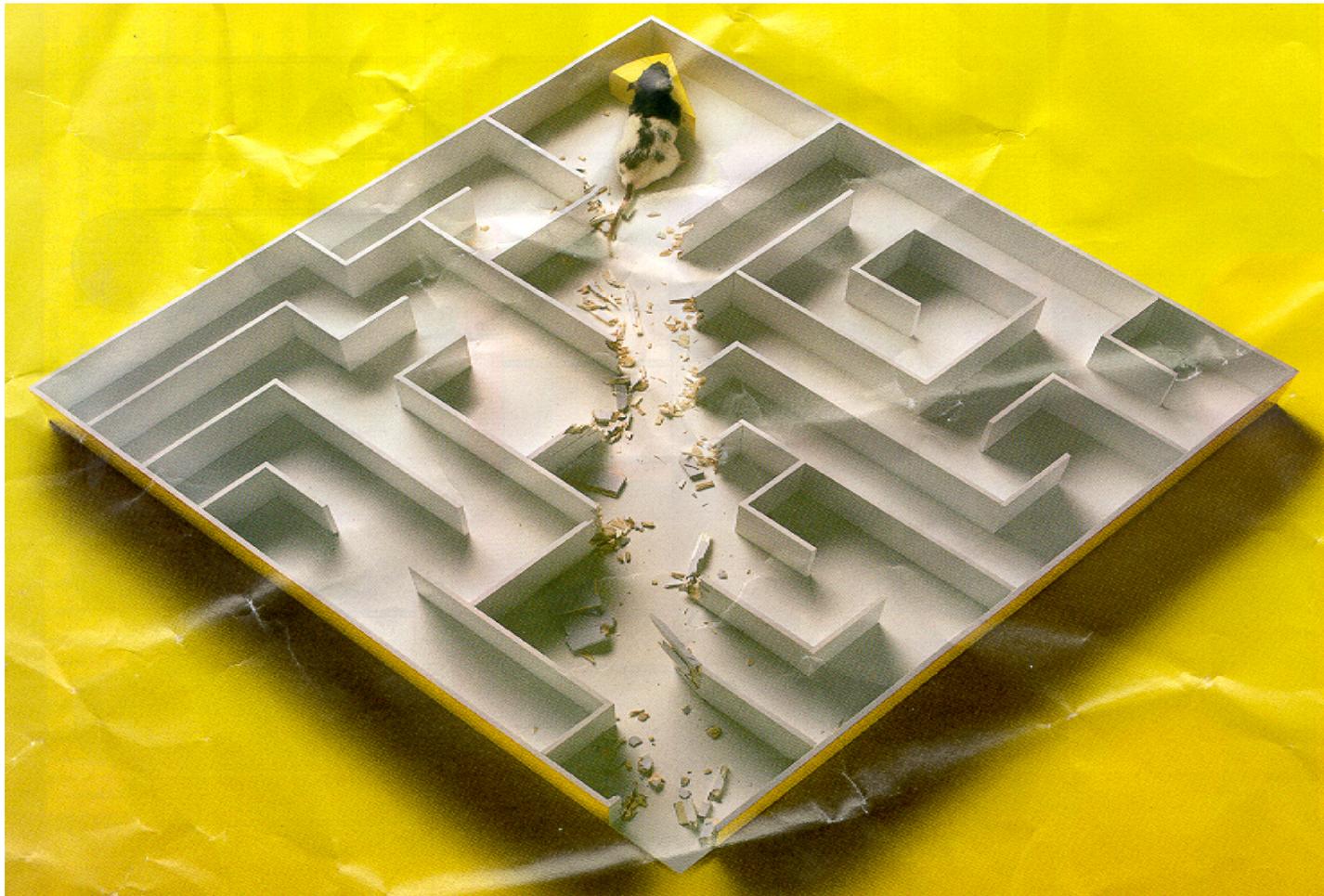
# Kirkhill-TA Lessons Learned

- Must be driven by top management
- No silver bullet – If anything, it is sustained through faith and trust in the process.
- Communications vital, get people engaged
- Layered auditing minimizes backsliding.
- Effective training has a good payback.
- Administrative gains can be significant.
- Use factual metrics to track progress.

**Over time it becomes part of the DNA  
of the company.**

# SEA Roadmap

## IT'S ALL ABOUT VELOCITY & CUSTOMER FOCUS !





**Thank You**