
Lean Thinking Introduction

The Evolution

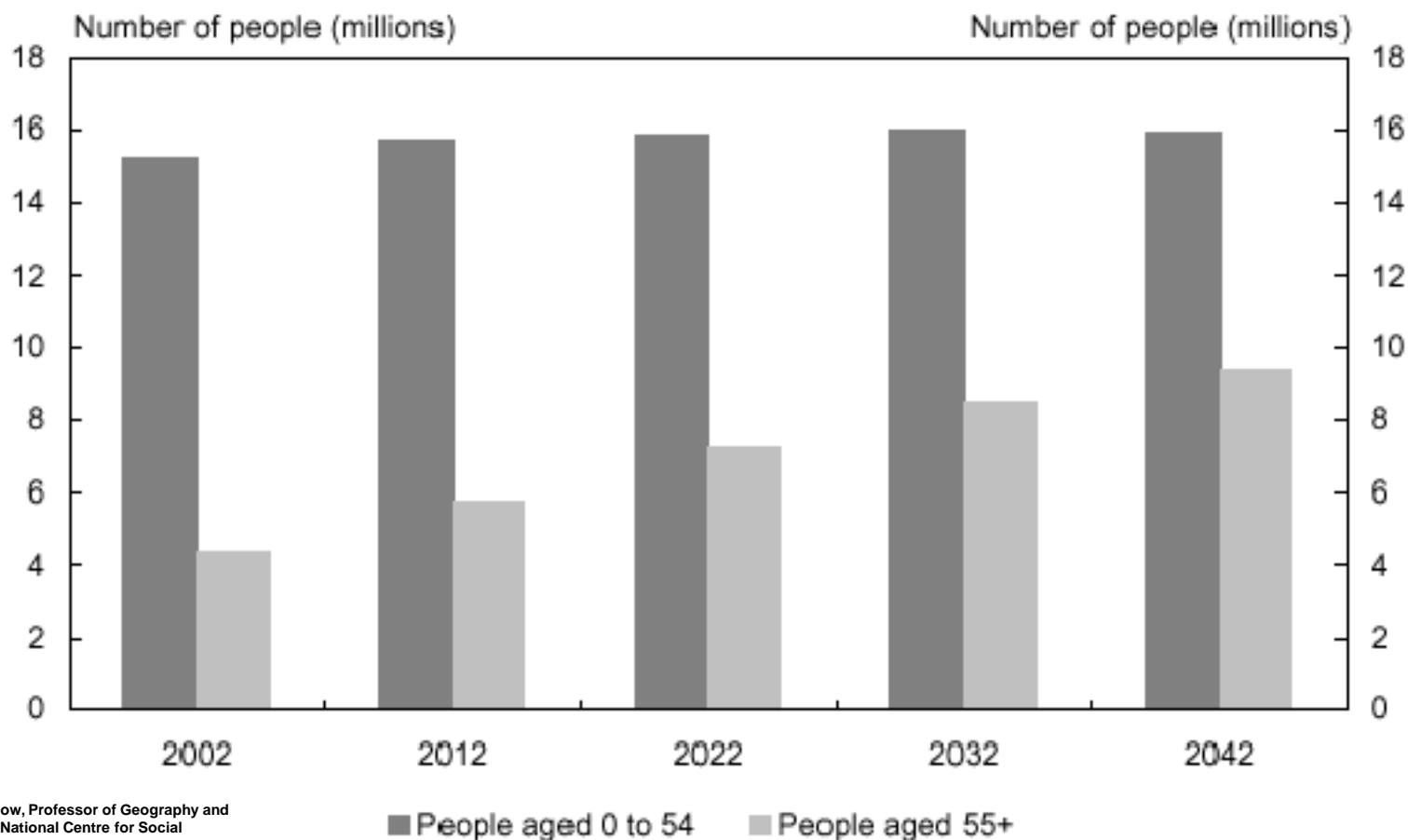
Economic Influences

- Demographics
- Industry Trends
- Social Values
- Competition

Intergenerational Report

Projected Population Size for Selected Age Ranges

Source: Costello, 2002, 5



Projections of Australia's Aged and Working Age Population

Year	Number by Age			65+ as %
	0-14	15-64	65+	15-64
2003	3,981,538	13,344,685	2,546,423	19.1
2011	3,840,000	14,532,900	3,155,600	21.7
2021	3,752,700	15,172,300	4,443,400	29.3
2031	3,826,400	15,348,100	5,741,000	37.4

Annual Growth Rate (%)

2003-11	-0.45	1.07	2.72
2011-21	-0.23	0.43	3.48
2021-31	+0.19	0.12	2.60

Graeme Hugo
Federation Fellow, Professor of Geography and
Director of the National Centre for Social
Applications of GIS,

The University of Adelaide

Annual Additions to Workforce

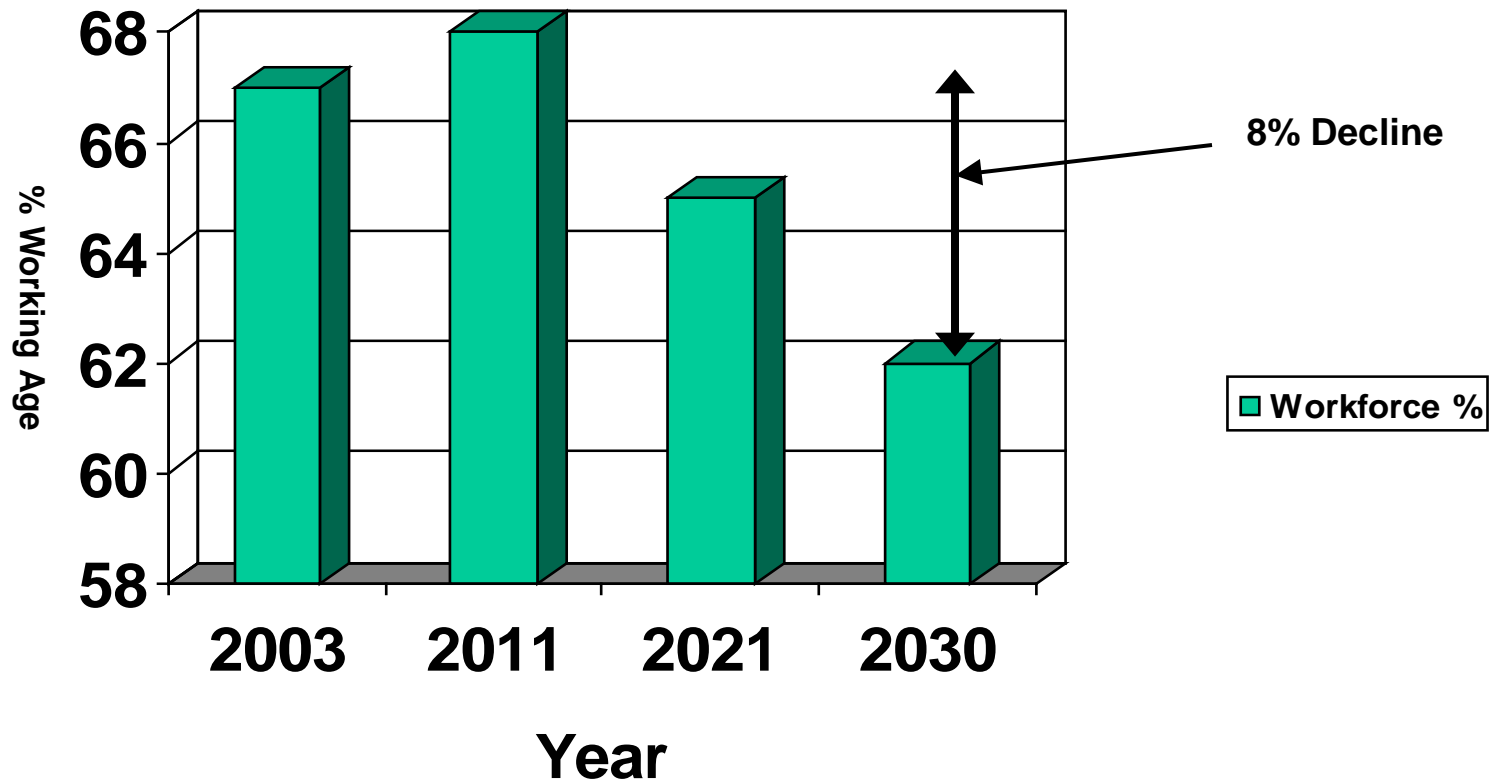
(Access Economics)

Now: 170,900 in single year

2020-2030: 125,000 in entire decade

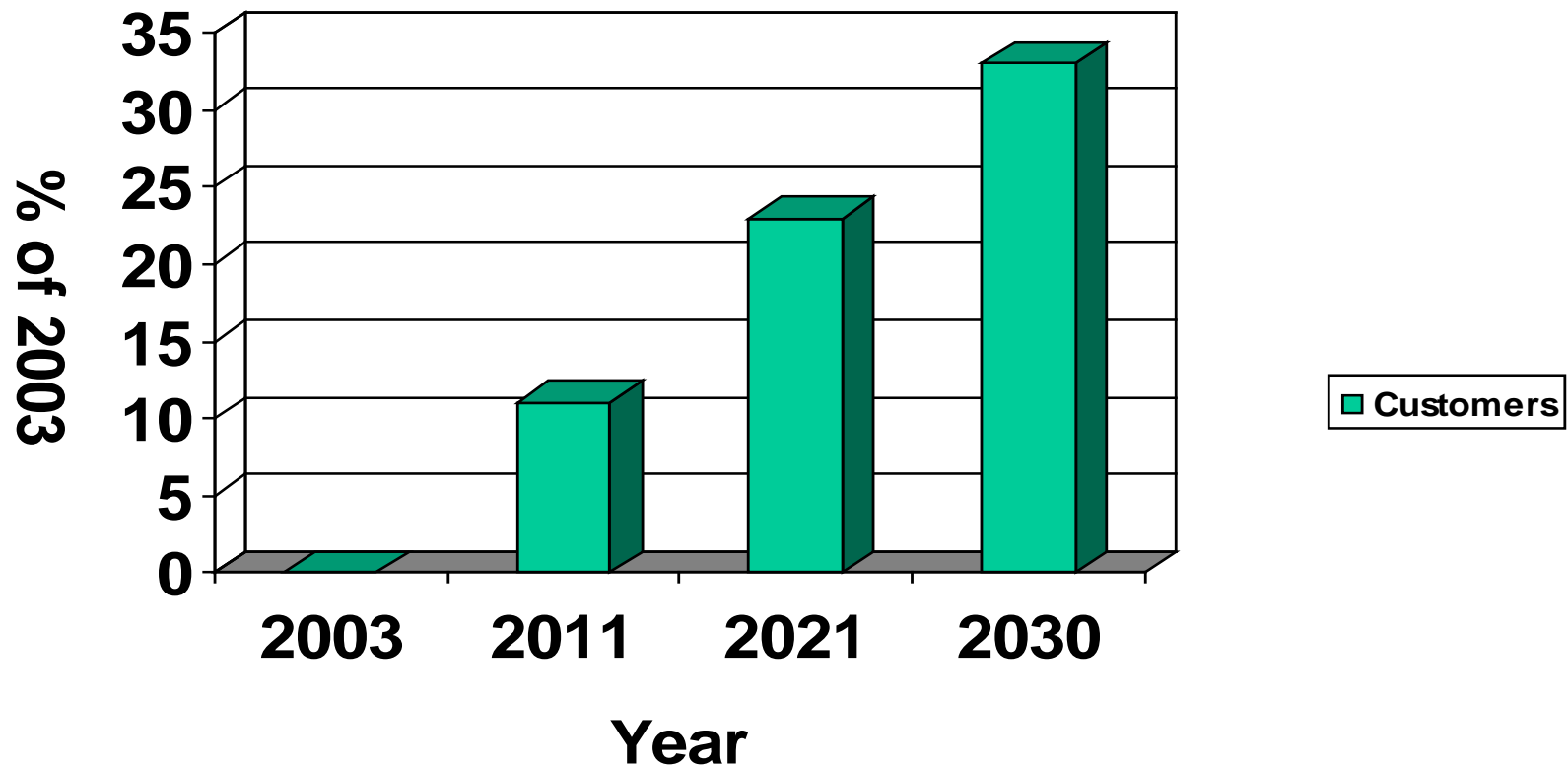
Implications for Business

Available Workforce Trends



Implications for Business

Customer Growth Trends



Over 15 years of age

Implications for Business

- Non availability of new staff
- Competition for existing staff
- Need to be about 10% more productive by 2011
- And to be over 40% more productive by 2030.
- Aged Segment may put even more load on systems than working segment ???

Why Lean Thinking

- Based on Toyota Management System
- Auto Industry Cost Downs every year
- Has overtaken GM as Worlds largest Auto maker.
- Similar sales volumes but GM lost 2 Billion Last year.
- Toyota made a profit of \$11.8 Billion

The Path to Lean

- PRE 1989** ♦ 30+ years Evolution in Toyota and Japan
- 1989** ♦ Machine That Changed The World
♦ Lean Manufacturing
- 1992 & 95** ♦ Lean Enterprise Benchmarking Reports
♦ Lean Supply
- 1996** ♦ Lean Thinking
♦ Lean - A Generic Process
♦ Thinking - The Real Challenge

LEAN THINKING THE CHALLENGE

THE BENEFITS

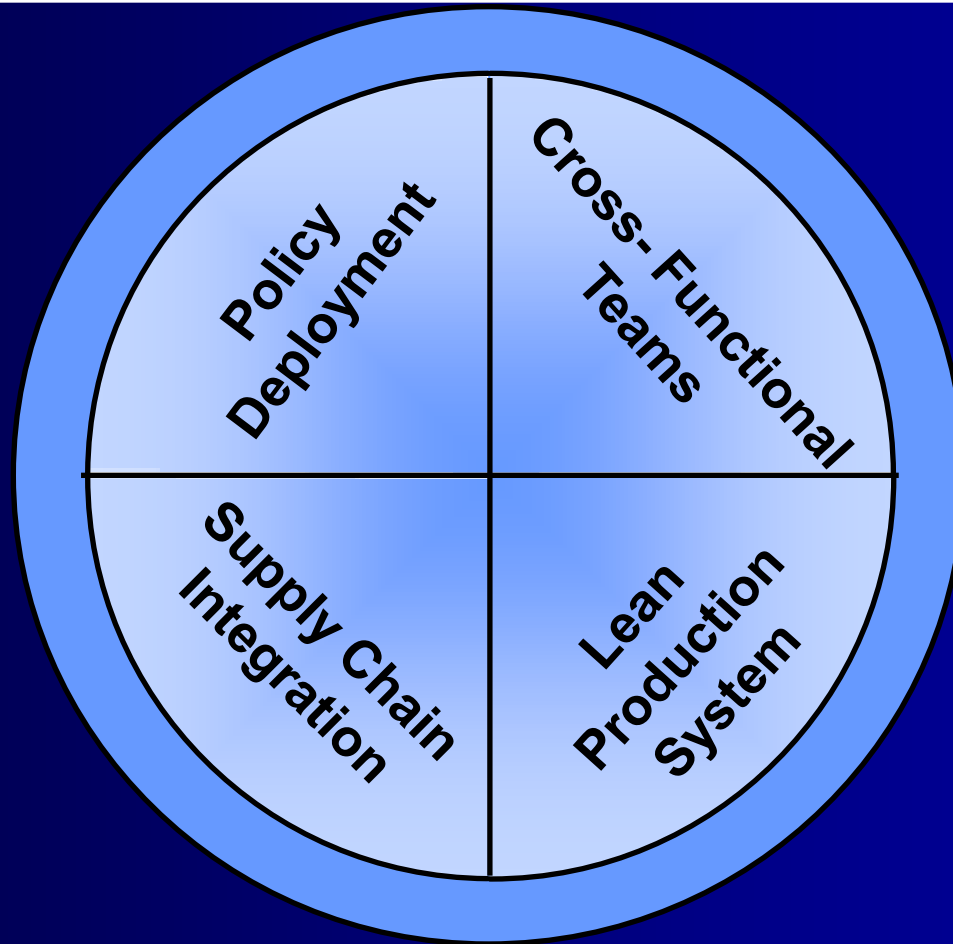
The Hard (typically)

- ◆ Growth 30%+ in 1 year
- ◆ 25%+ Productivity in 1 year
- ◆ 30% Inventory Reduction in 1 year
- ◆ 50% Space Reduction in 1 year
- ◆ Vastly Improved Customer Quality
- ◆ 100% Customer Delivery
- ◆ 50% Throughputs Lead Time Reductions
- ◆ Vastly Improved Supplier Performances
- ◆ Ability to Achieve Year on Year Cost Reduction

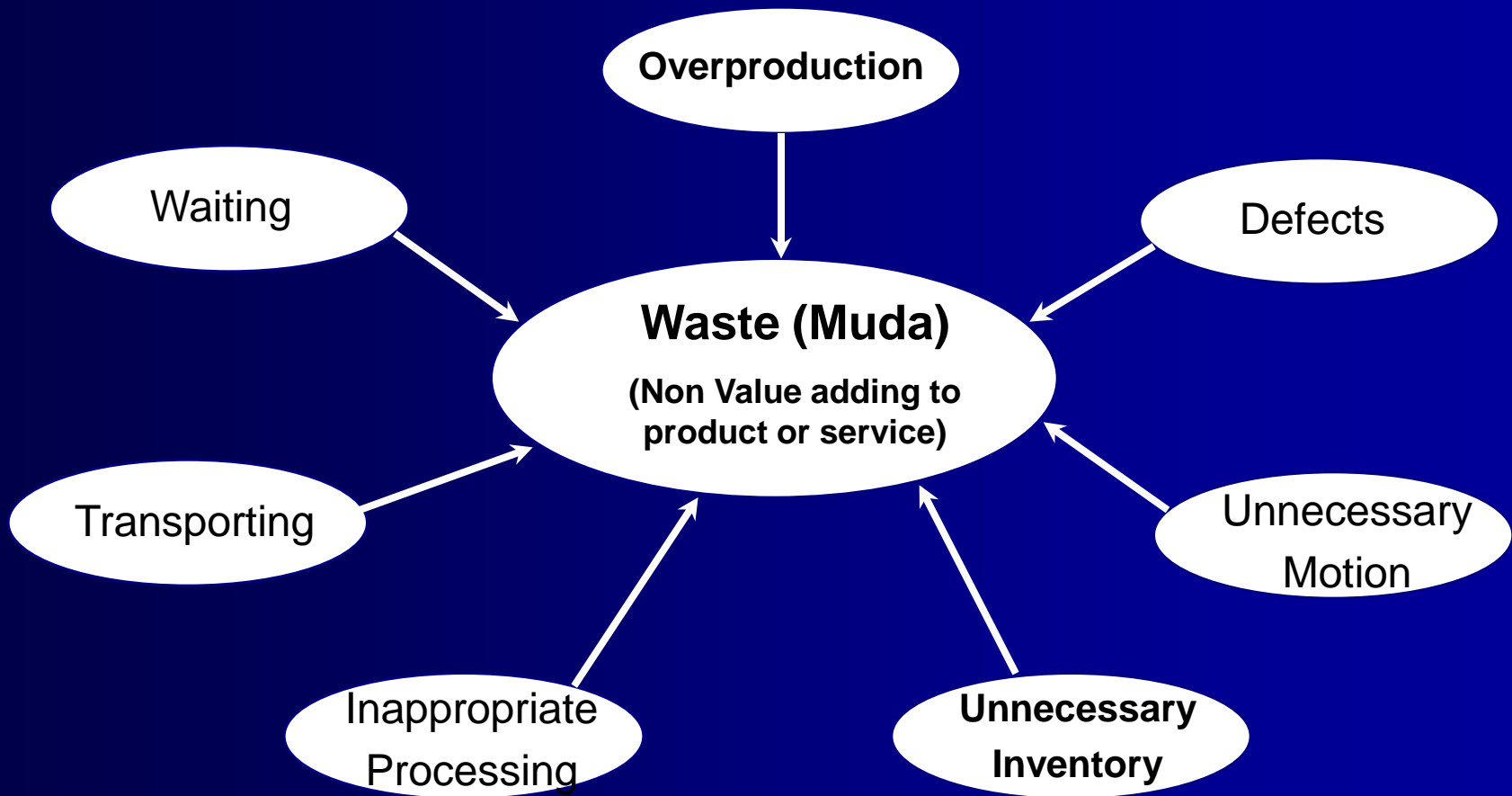
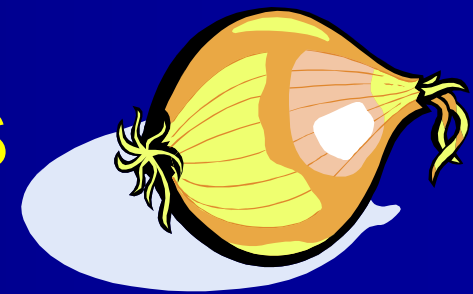
The Soft

- ◆ Flexible Structures Aligned to Business Goals
- ◆ Roles and Responsibilities Aligned to Business Goals
- ◆ Process Driven Culture
- ◆ Visual Demonstration of Achievements
- ◆ Visual Abnormal Situations
- ◆ Aligned & Deployed Improvement Goals
- ◆ Believable Predictable Results
- ◆ Increased Employee Ability and Morale
- ◆ Focused Application of Resources Return

The World Class Differentiators



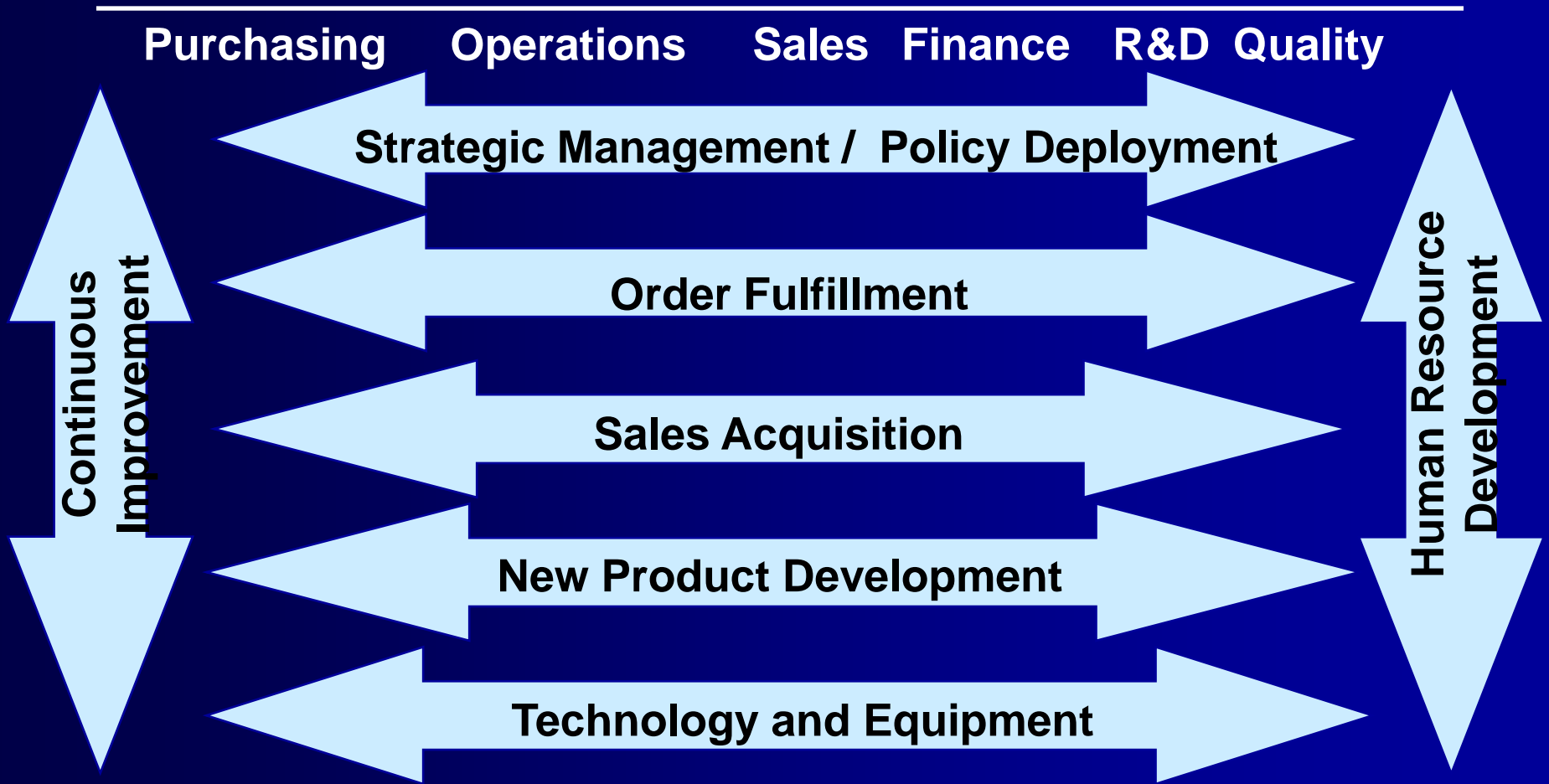
The Seven Wastes



A Process Activity Mapping Example

STEP	FLOW	AREA	DIST MTS	TIME MIN	PEOPLE
Trigger - Lorry Arrives		Roadside	0	0	0
Driver Waits	d	Delivery Bay	0	1	1
Lorry driver walks to find Terry or John	t	Stores	10	0.25	2
Delays due to Terry or John being busy on other jobs	d	Stores	0	10	1
Terry or John walk to get forklift.	t	Stores	5	0.5	1
Forklift to Lorry	t	Delivery Bay	8	1	1
Unload boxes onto forklift	t	Delivery Bay	0	1	1
Transfer boxes to weighing scales	t	Delivery Bay	3	1	1
Check weight against delivery note	i	Delivery Bay	0	1	1
Inspect Spec. using micrometer	i	Delivery Bay	0	1	1
Transfer Boxes to racks in stores	t	Stores	5	1	1
Batch delays for unloading other boxes.	d	Stores	48	6	1
Enter location of rack onto location sheet.	o	Stores	0	0.5	1
Walk to office.	t	Store Office	15	0.25	1
Check delivery note and C of C against filed purchase order	i	Store Office	0	2	1
Sign driver's copy of delivery note.	o	Store Office	0	0.1	2
Enter information from delivery note into batch book	t	Store Office	0	1	1
Delays for information entry as other lorries wait for attention	d	Store Office	0	60	1
Enter batch no. and date stamp onto delivery note	d	Store Office	0	1	1
Split delivery note and C of C into separate sheets	t	Store Office	0	0.25	1
File C of C and leave delivery note at side of table	t	Store Office	0	1	1
Acquire raw material tags and fill in from batch book	t	Store Office	0	6	1
Staple tags onto boxes	o	Stores	0	0.25	1
Batch delay for stapling onto all boxes	d	Stores	0	2	1
Frank delivers delivery note to purchasing	t	Purchasing	120	10	1
Waits for action	d	Purchasing	0	5040	1
Transfer info from delivery note to filed purchase order	t	Purchasing	3	5	1
Input data to computer system	o	Purchasing	0	0.5	1
Batching delays	d	Purchasing	0	5	1
Filing of the delivery notes	t	Purchasing	0	6	1
		TOTALS	217	5164.6	31
ACTIVITY			METRES	MINS	PEOPLE

Key Business Processes

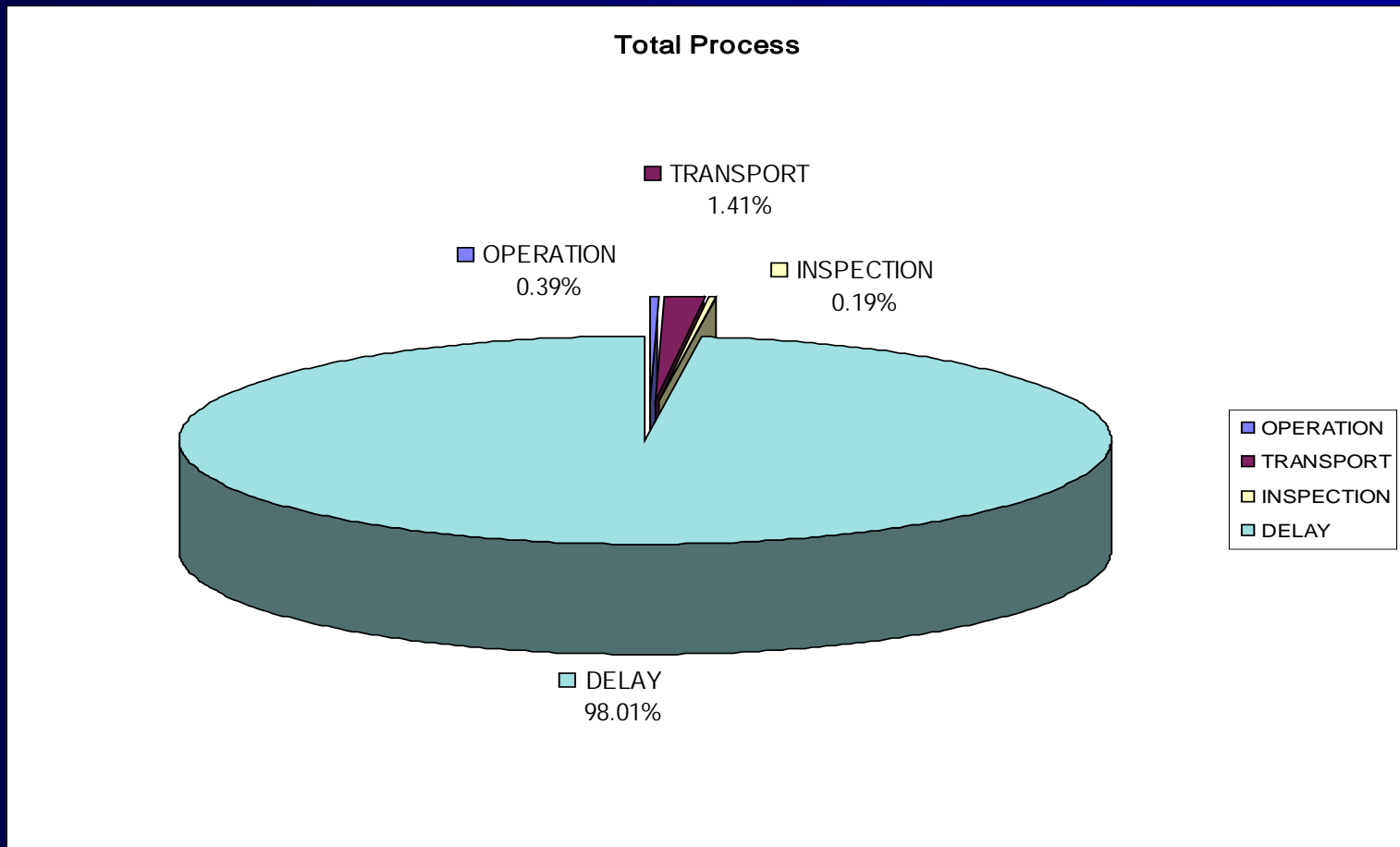


Process Activity Mapping - Order Fulfilment Process Example

	OPERATION	TRANSPORT	INSPECTION	DELAY
Customer Forecast Processing	0	2.1	0	7200
Production Planning	3.7	51.9	12	1035.4
Material Planning/Purchasing	3.3	38	18	8192.1
Stock Replenishment Process	0.1	1.5	5	8
Goods Receiving/Inspection	0.1	19.2	10.5	158.2
Raw Material Store	0.1	30.5	0	15162
Moulding Shop Store & Drying	240	38.3	9.5	1549
Moulding/Packing	15.1	602.6	3.1	15921.4
Stock Transfer	2	13.1	1	14502.1
Finished Goods Despatch	0.1	176.6	0	7317
Tool Room	5	20	15	150
Invoicing	1	5	20	480
Inspection Activities	15	31.7	46.1	74.1
	285.5	1030.5	140.2	71749.3
	0.39%	1.41%	0.19%	98.01%
	OPERATION	TRANSPORT	INSPECTION	DELAY

Value Stream Mapping

Order Fulfilment Process Example



Measures and Targets by Function

Responsiveness Conflicts

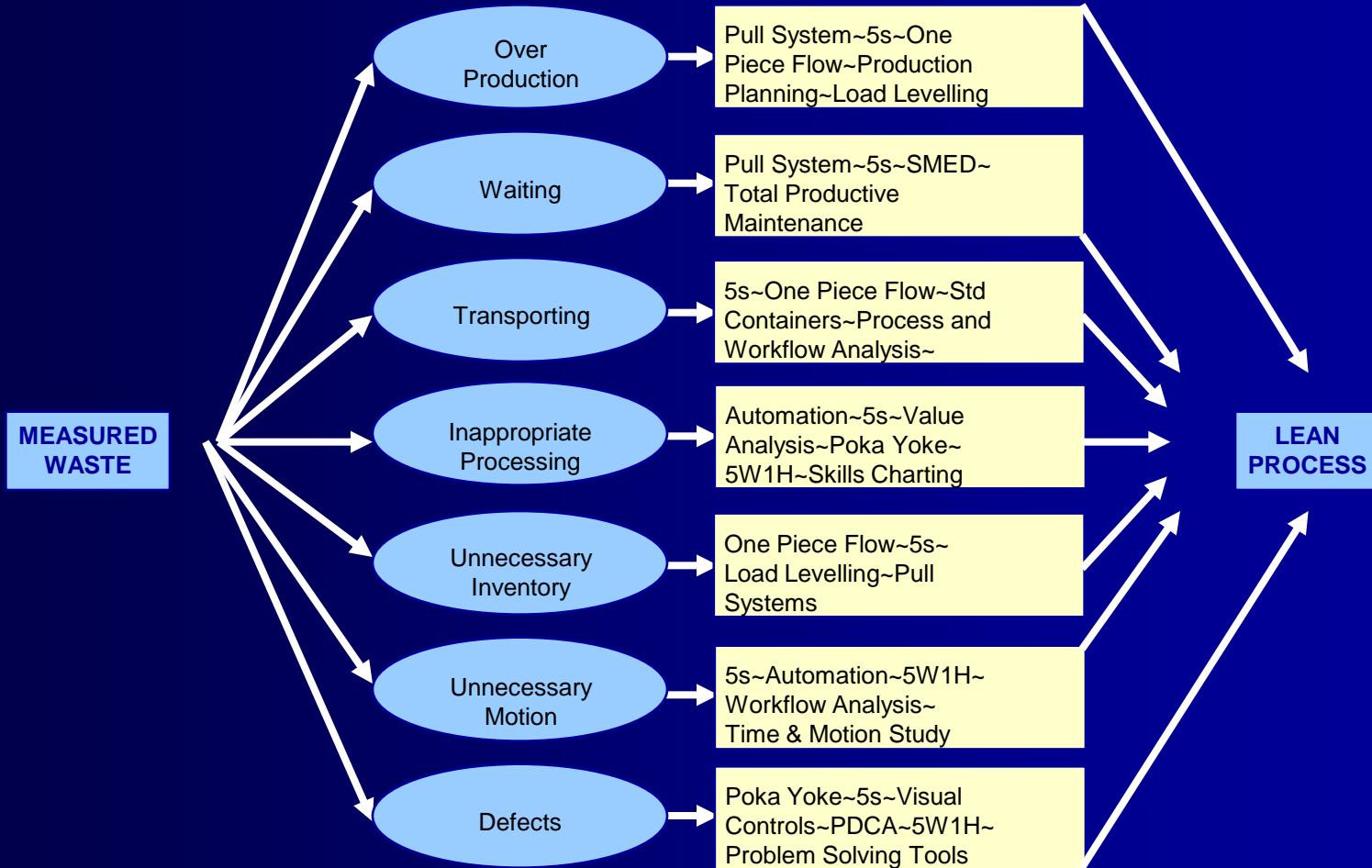
< DRIVING CONFLICTS

Focus	Purchasing	Production	Marketing	Finance	Logistics
Bulk Purchase	Discounts ✓	Availability ✓		Working Cap ✗	Space ✗
Long Prod'n runs	Discounts ✓	Schedule & Costs ✓	Narrow Range ✗	Working Cap ✗	W'house Costs ✗
Broad Prod. Ranges	Low Volume No Discount ✗	Short Runs High Cost ✗	Wider Sales ✓	High fin. Goods ✗	Space and admin ✗
Tight Fiscal Control	✗	✗	Loss of sales ✗	Working Cap ✓	✗
Decreased Delivery Time	✗	✗	Better Service ✓	Higher Cost ✗	Service Level Financing ✗
Full Trunker Loads		Schedule & costs ✓	Anti Small Customers ✗		Eliminate Costly Calls ✓

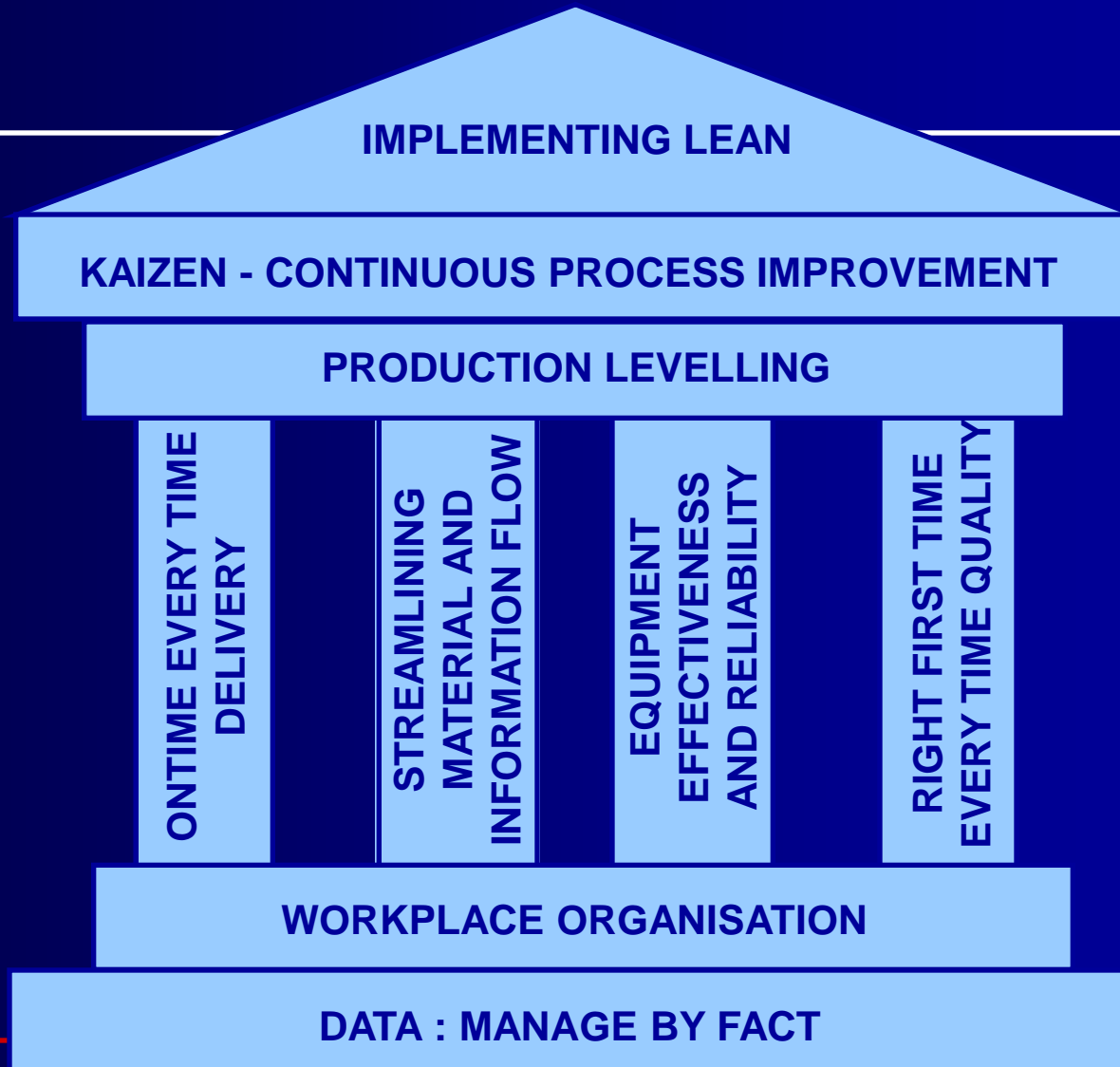
Lean Thinking Principles



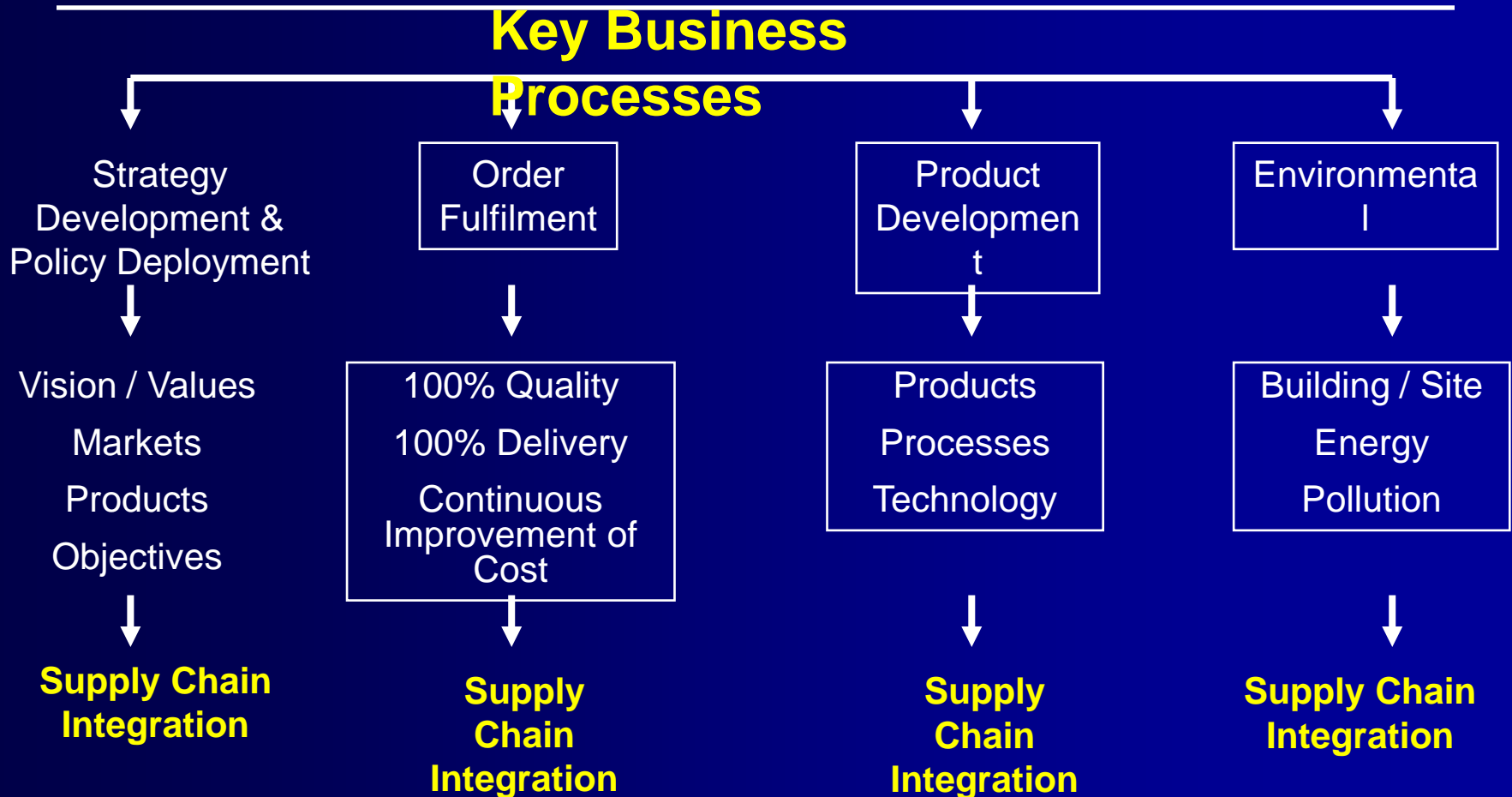
Applying Lean Principles



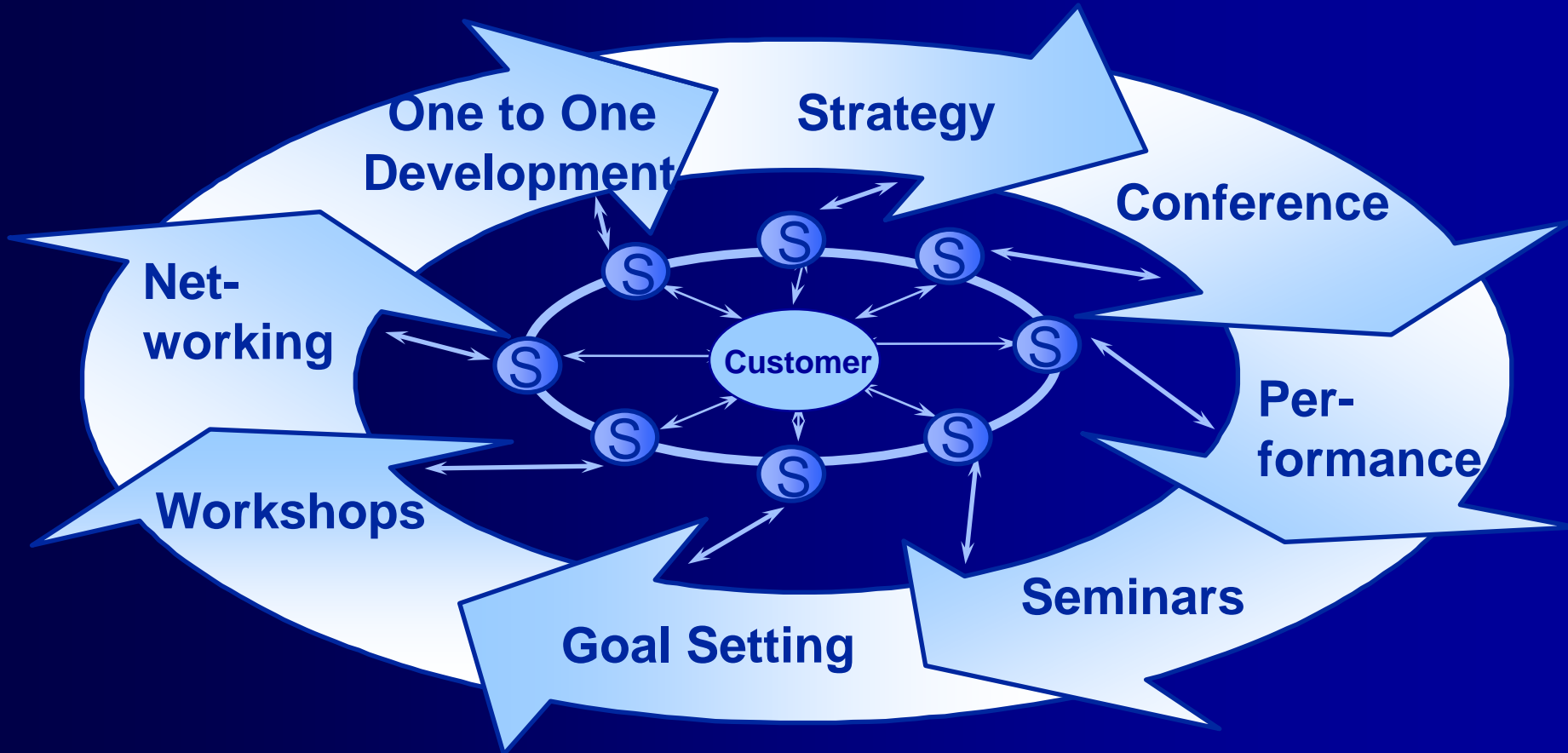
Lean Production Systems



Implementing Lean



A Supply Chain Integration Process



The Starting Point

- ◆ Specify the Value and Muda by product or service from the Customer's perspective.
- ◆ Identify the Whole Value Stream from concept through to delivery.

*Most of what we do is Muda
Removing Muda is the biggest gain*

In Search of Perfection

- ◆ Perfection is the complete elimination of Muda - when every activity creates value for the customer
- ◆ Learning to See Muda: The more we see, the more we can do

Lean Thinking since 1980

- Has made a significant contribution to academia & industry
- Had gaps in its early approaches
- Has seen significant developments

Awareness Stage: 1980-1990

Theme	Shop Floor Practice
Focus	JIT Techniques, Tools
Business Process	Shop Floor Manufacturing
Industry Sector	Automotive Assembly
Gaps	Outside Shop Floor Outside Single Firm Narrow Focus

Quality Stage: 1990-mid 1990s

Theme	Best Practice Benchmarking
Focus	Cost, Quality, Reengineer
Business Process	Manufacturing & Mat. Mgt
Industry Sector	Automotive Ass./ Supply
Gaps	Human Element Supply Chain Systems Perspective

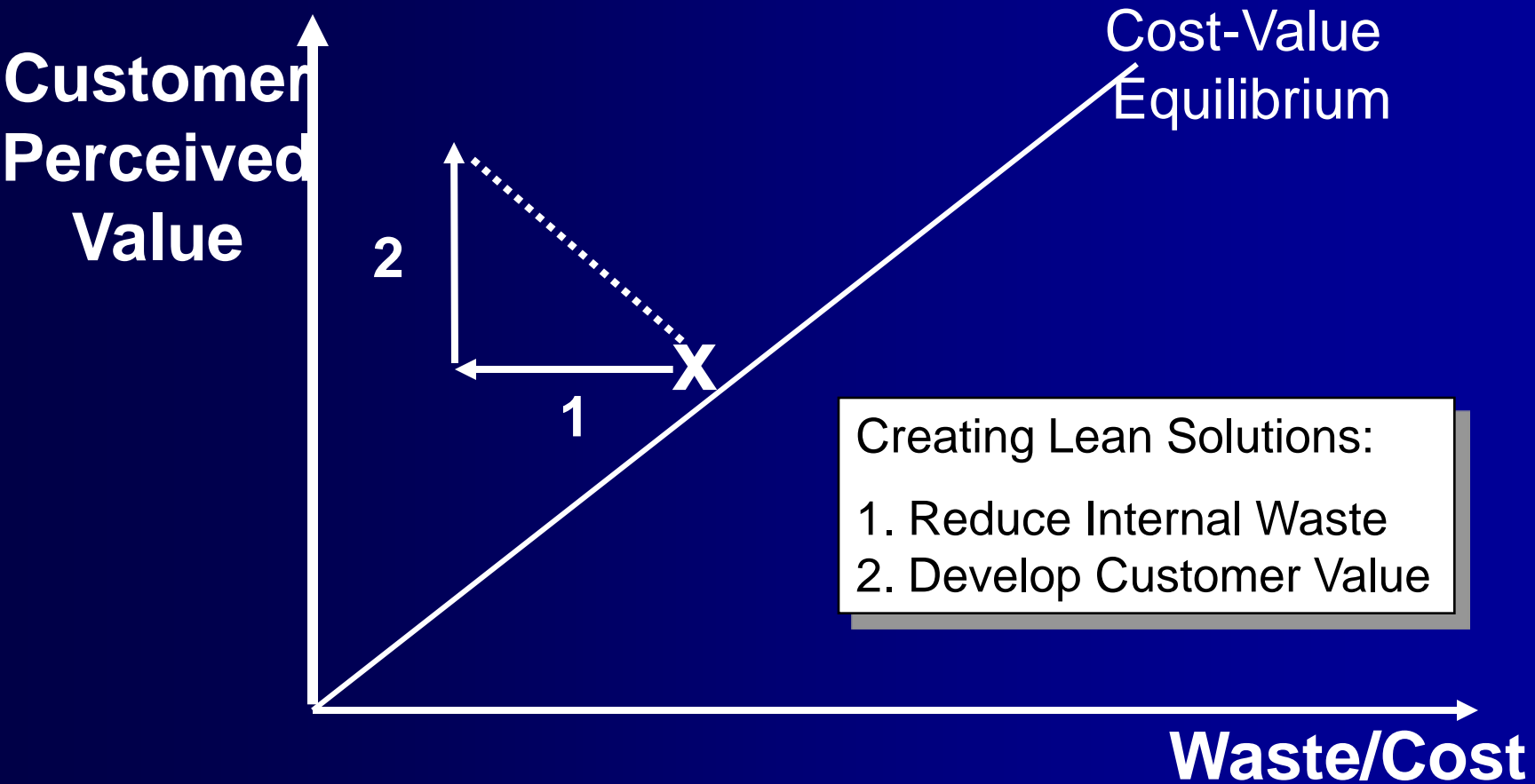
Quality, Cost, Delivery Stage: Mid 1990s-2000

Theme	Lean Enterprise
Focus	Cost / Process QCD
Business Process	Order Fulfilment: Val. Str.
Industry Sector	(Repetitive) Manufacture
Gaps	(Other) Process Integrate Relationships Integrating Industries

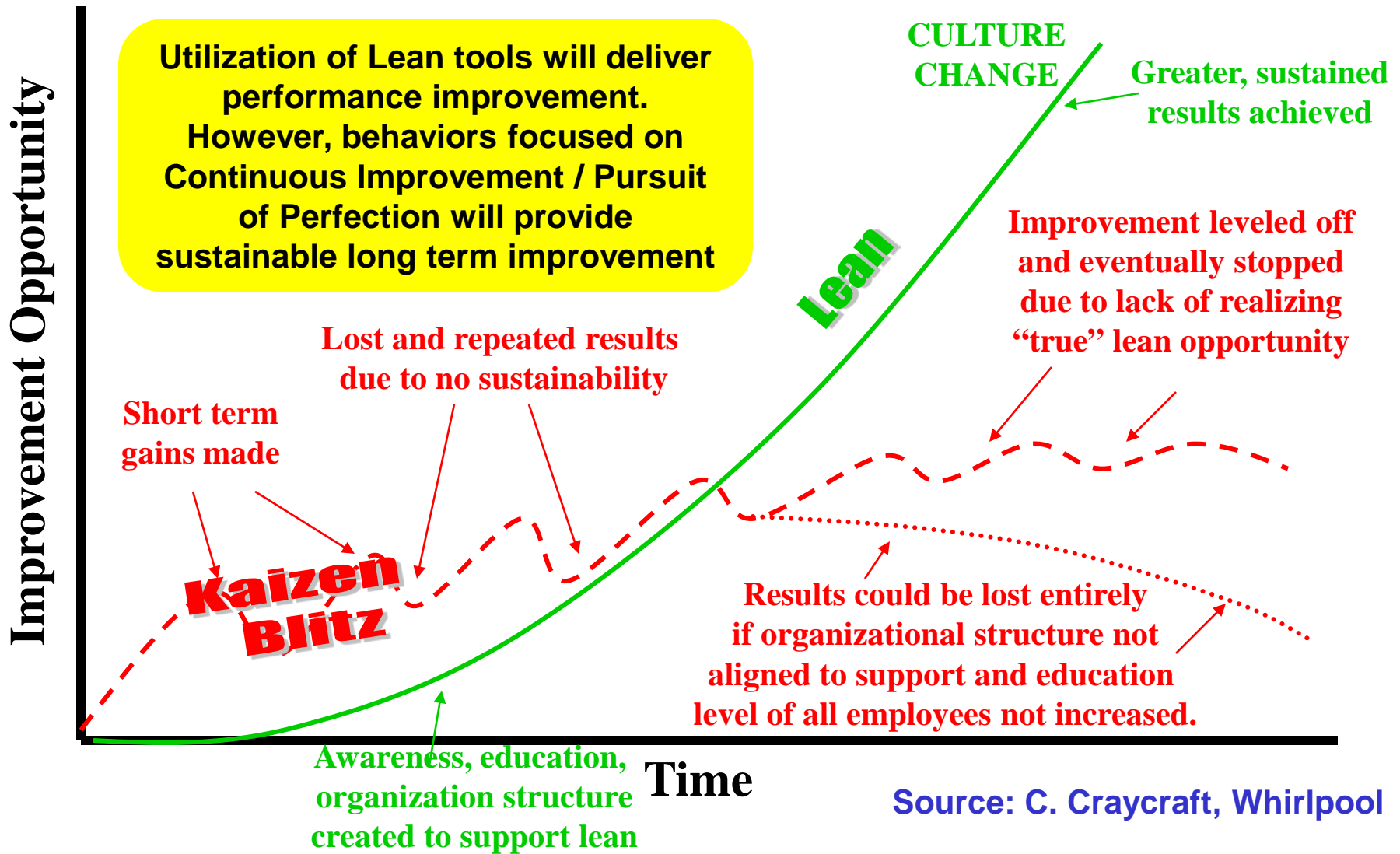
Value System: 2000+

Theme	System Capability
Focus	Value & Cost
Business Process	Integrated Processes
Industry Sector	All Manufacturing/Service
Gaps	Low Volume Manufacture Strategic Integration Total Systems Capability

Relation of Value, Cost & Waste



Kaizen Blitz vs. Lean



Current Lean Thinking

- Clear Evolution from early 1980s
- Integrative Approach
- Focus on Value & Cost
- Strategic & Operational Level
- Contingent Toolkit

Focus now on: Lean Value Systems:

Encompassing a value adding network of operations across companies, with the goal of providing a series of contingent value propositions to individual final consumers.