



SIX SIGMA GROUNDING

KAUL ASSOCIATES

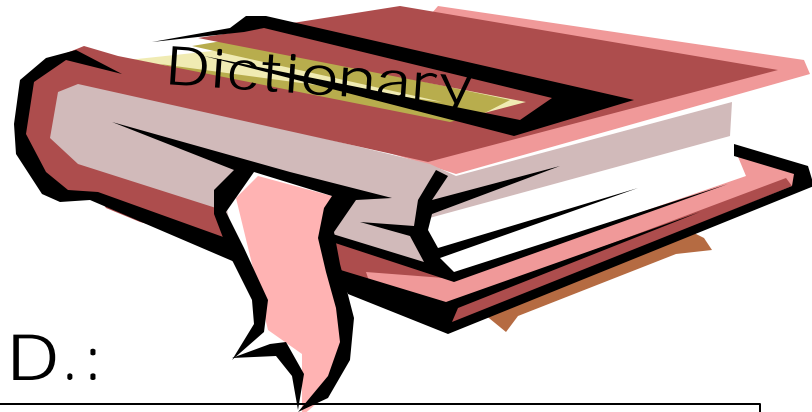
Objectives

As a result of this module, you will be able to:

- ∅ Describe what is meant by the term “Six Sigma”,
- ∅ Explain the need for improvement to “Six Sigma” levels of performance,
- ∅ Describe approach to Six Sigma including:
 - Purpose of Six Sigma program
 - Structure of and resources in Six Sigma effort
 - Roles
 - Use Thought Process Map on your project

“Six Sigma” is:

- ∅ A business improvement PHILOSOPHY.
- ∅ An improvement PROCESS.
- ∅ A statistical MEASUREMENT, and performance GOAL.

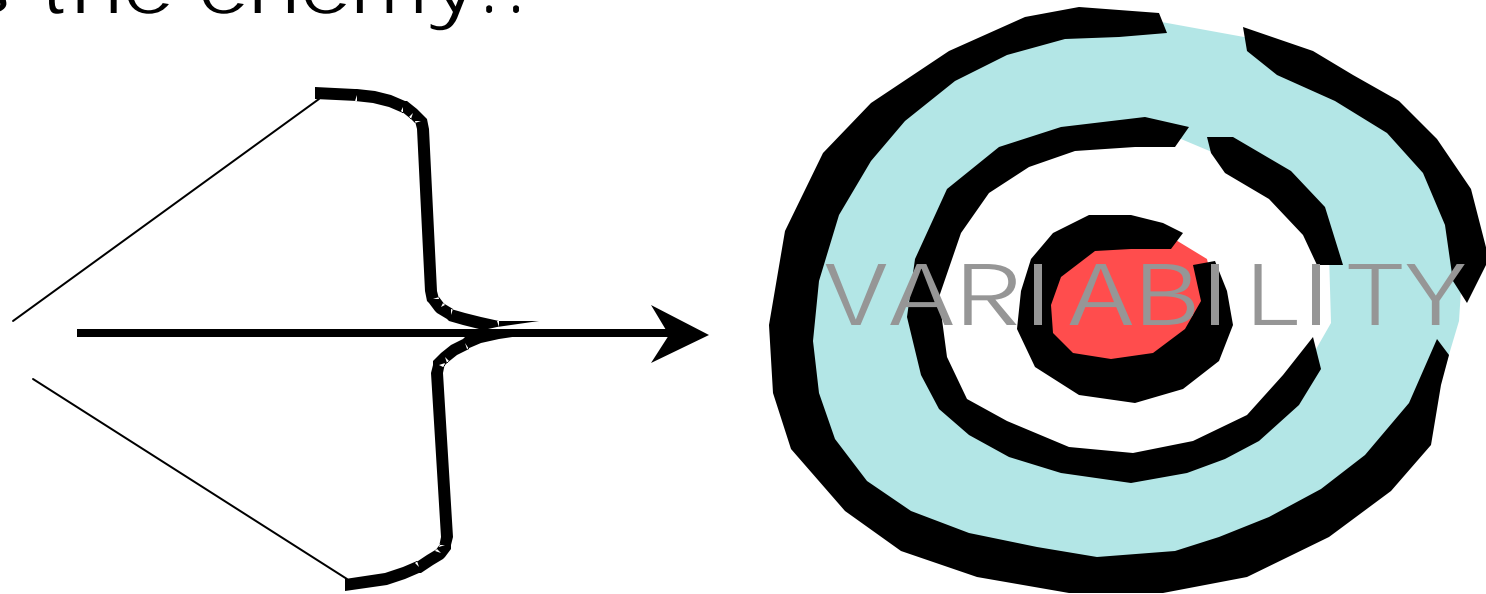


From Mikel Harry, Ph.D.:

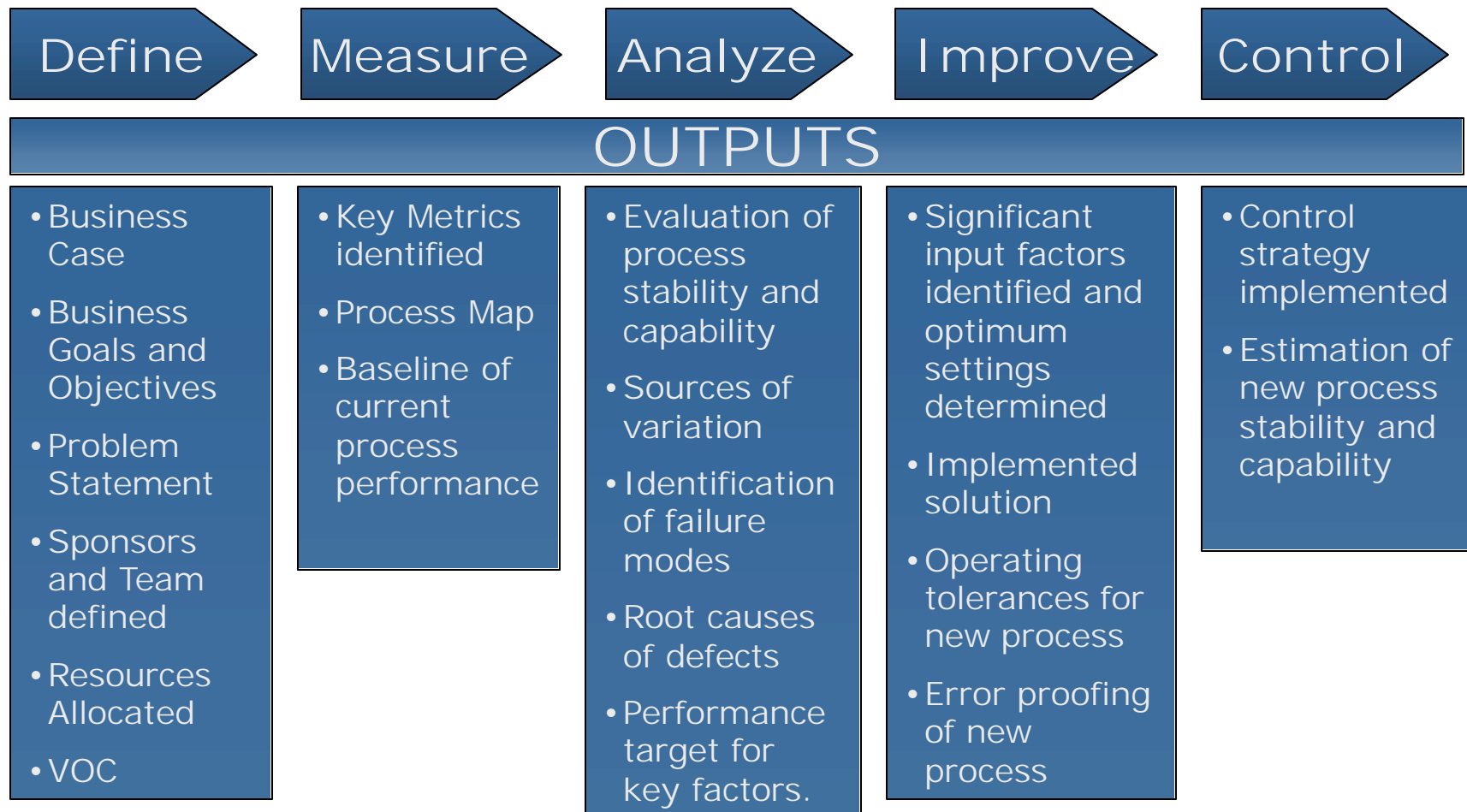
“Six Sigma is first, a statistical measurement, second, a business strategy, and third, a philosophy.”

Six Sigma Philosophy

- ∅ Total customer satisfaction, today and tomorrow, focusing on variability as the enemy..



DMAI C Approach

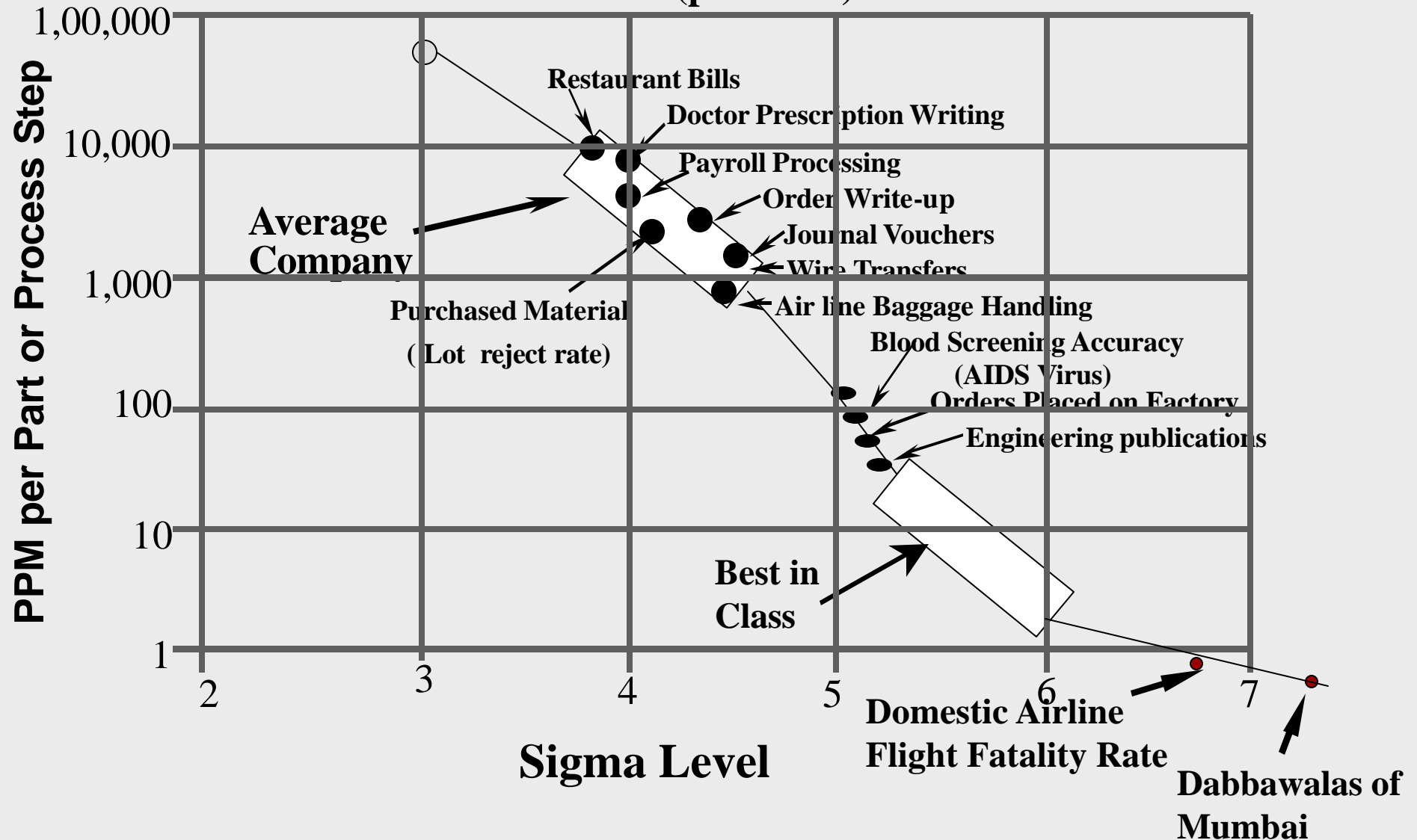


Six Sigma – The Measure

Sigma Level	Defects per Million Opportunities
3 S	66,807
4 S	6,210
5 S	233
6 S	3.4
7 S	0.02

Sigma Levels for Various Processes

• **IRS - Tax advice (phone-in)**



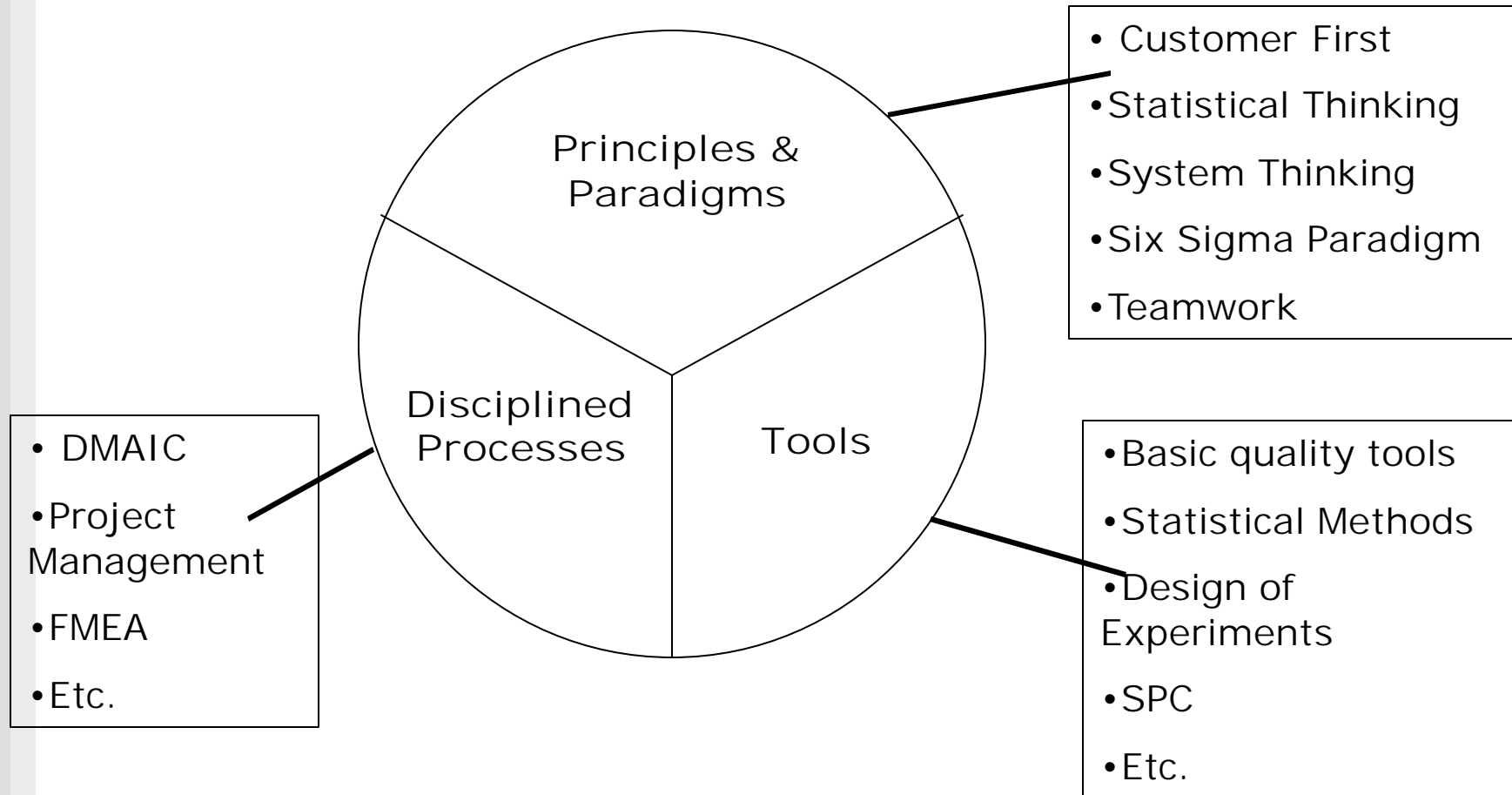
If You Were an Average Company in the US...

- ∅ You'd have:
 - Total defect levels of 6,210 parts per million (ppm)
 - Yield of 99.4%
 - Cost of poor quality of 15 – 20% cost of sales

- ∅ However, data for companies yet to embark on the Six Sigma journey indicates that they have:
 - Quality levels in 6,000-300,000+ ppm range.
 - Average yields of 83% (Range of 10-100%)
 - COPQ opportunity of 30-40% cost of sales

Think of the opportunity you have
by just becoming average!

Six Sigma - Principles, Processes and Tools



Principles & Paradigms

∅ Customer First

- Total Customer Satisfaction and Loyalty
- Customer Focused Behaviors

∅ Statistical Thinking

- All Work is a process
- All processes are variable
- Data is required to Understand Variation and Make Decisions

∅ Systems Thinking

- Company and Customers Part of a System
- Avoid Sub-optimization
- Cause & Effect often distant in Time or Space
- Actions often have Unintended Consequences

∅ Six Sigma Paradigm

- Systematic Identification/ Elimination of Defects in Every Process
- Requires: Procedural excellence
 Invariant Raw Materials
 Robust Design
 Capable Processes

∅ Teamwork

- Multi-Disciplined approach
- Live the Company Values.

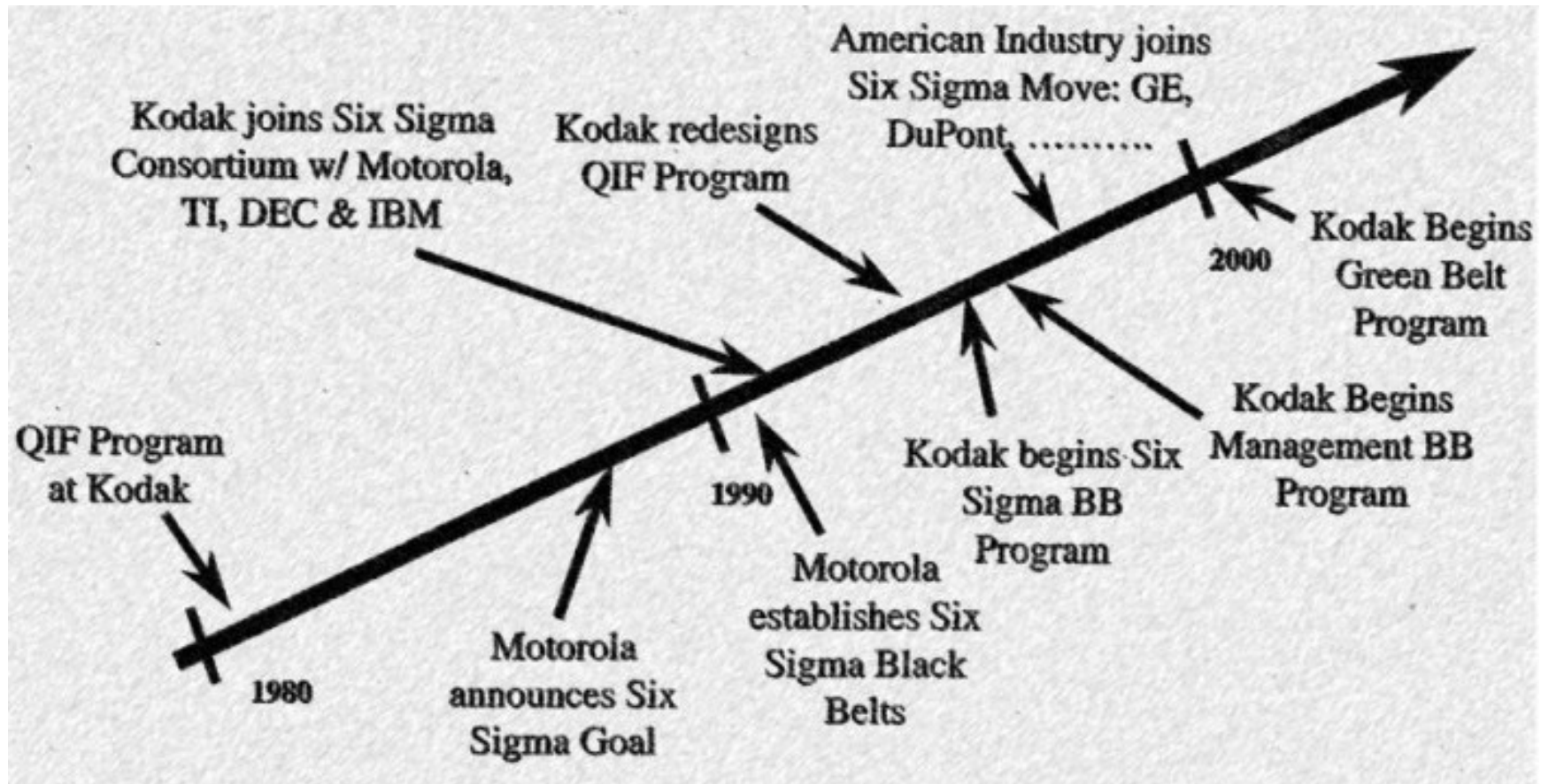
Tools

Leadership is Crucial...

“The bloody tools were a waste of time since without the management concepts supporting their continued use, systems will not improve”

Masaaki Imai, Chairman, the Cambridge Corporation
Chairman, the Kaizen Institute,
“Kaizen, the Key to Japan’s Competitive Success”

Six Sigma Chronology



SIX SIGMA is defined by the PROCESS as well as the RESULT it produces

∅ Process

1. Customer Focus
2. Data driven decision making
3. Structured Business processes

∅ Results

- a. Customer satisfaction
- b. Productivity (more with less)
- c. Employee engagement, satisfaction
- d. Right product at Right time
- e. Winning in the Market place

Commitment

Six Sigma Roles in a Company

- ∅ Management Black Belts
- ∅ Six Sigma Champions
(Typically Quality Director)
- ∅ Black belts
- ∅ Green Belts
- ∅ QIFs

Purpose of the Belt Program

- ∅ Accelerate the rate of improvement in defect and cost reduction, cycle time and product/ process reliability.
- ∅ Institutionalize the effective use of Belt Skills.
- ∅ Raise the expertise level of all Belts
 - Transfer new ideas and techniques
 - Promote the sharing of successes and failures
 - Establish lines of communication between GBs, BBs & QIFs

A Management Black Belt Is....

- ∅ A certified position
- ∅ A line manager with sufficient knowledge of quality concepts and tools to provide effective leadership, role modeling, and reinforcement of Six Sigma initiatives
- ∅ The owner of the Six Sigma improvement strategy and plan
- ∅ The owner/ leader of some improvement projects

Belt Functions and Tasks

- ∅ Lead efforts to improve quality and cycle time and eliminate waste.
- ∅ Facilitate teams to identify and implement change.
- ∅ Apply statistical methods/ analysis to improve processes.
- ∅ Mentor at the local or organizational level.
- ∅ Teach and coach local personnel and Management in new strategies and tools.
- ∅ Discover new application opportunities for Six Sigma.
- ∅ Identify business opportunities through partnerships with other organizations.
- ∅ Influence the organization on the use of six sigma strategies and tools.

A Six Sigma Champion is...

- ∅ A member of the leadership team
- ∅ Knowledgeable (awareness or practicing level) of Six Sigma methods and tools
- ∅ The creator & manager of the Six Sigma improvement plan
- ∅ An advocate for Six Sigma
- ∅ The coordinator of the local Six Sigma resources

Six Sigma Improvement Projects

The project should:

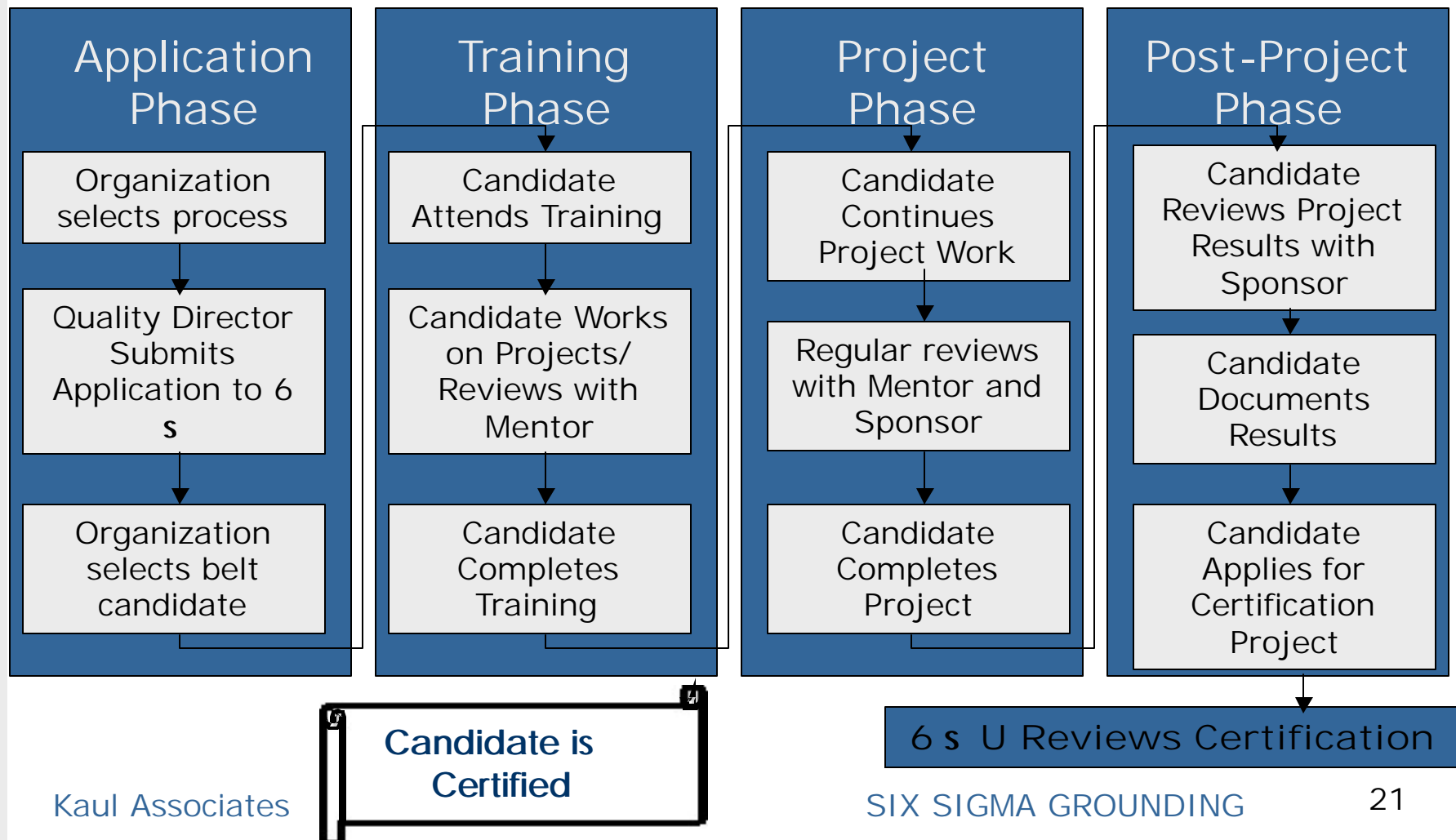
- ∅ Result in significant return to the organization
- ∅ Allow for completion within 5 to 12 months
- ∅ be one on which the Belt has authority to work
- ∅ Have one or more of the following objectives:
 - Improvement of Customer Satisfaction
 - Revenue Growth
 - Defect Reduction
 - Cycle time reduction
 - First Pass yield Improvement
 - Lead Time Reduction
 - Variability Reduction
 - Product performance optimization
 - Process performance optimization
 - Cost reduction
 - Cost of quality reduction
 - Improvement of delivery



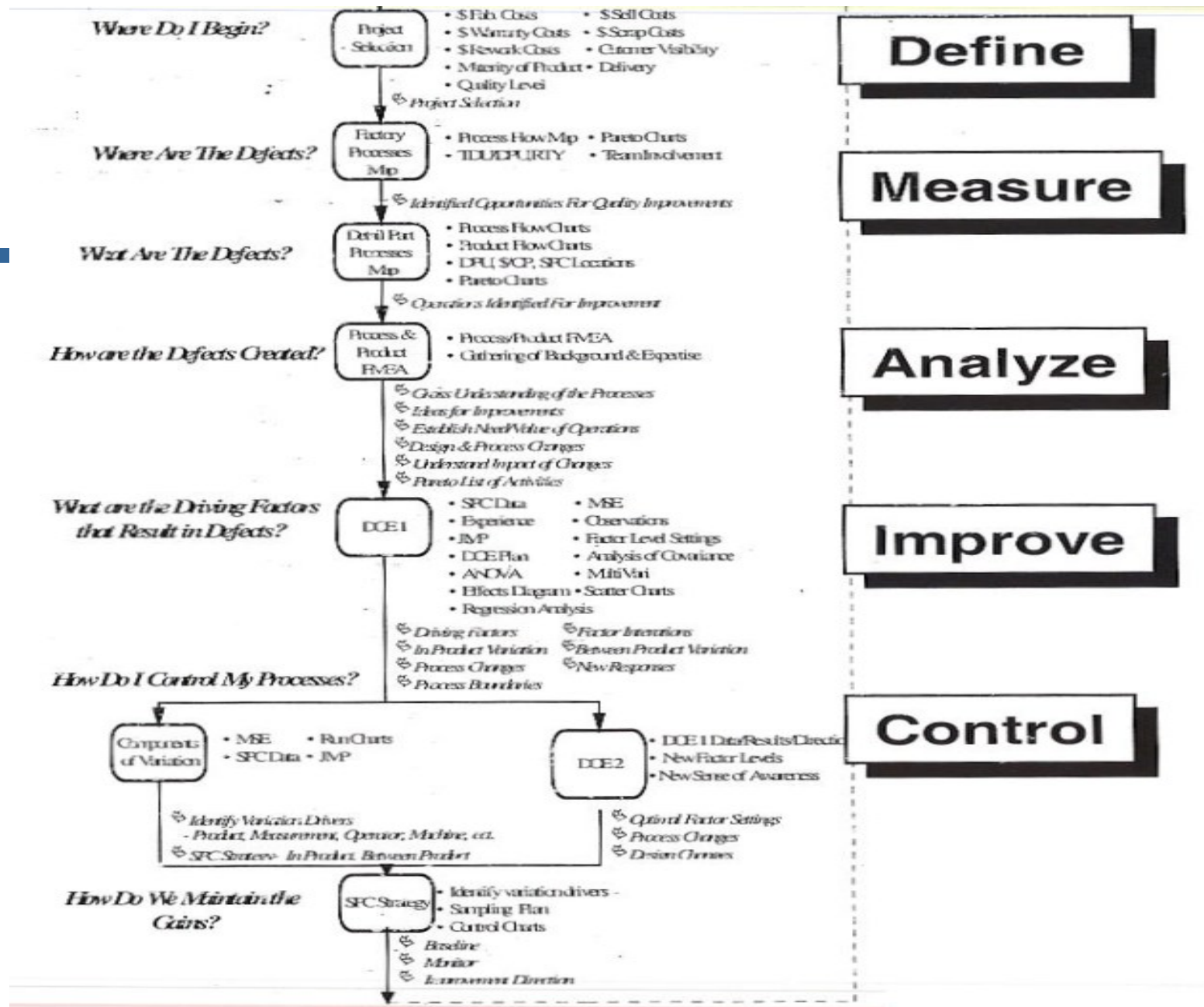
A Belt is...

- ∅ a highly motivated, self starting individual, respected in their organization
- ∅ trained and certified in statistical and supporting competencies
- ∅ an agent for change for the Six Sigma Paradigm
- ∅ assigned to key improvement projects
- ∅ a resource for the basic quality tools and methods
- ∅ an advanced user and teacher of 6 sigma tools
- ∅ expected to produce predefined business & customer satisfaction results

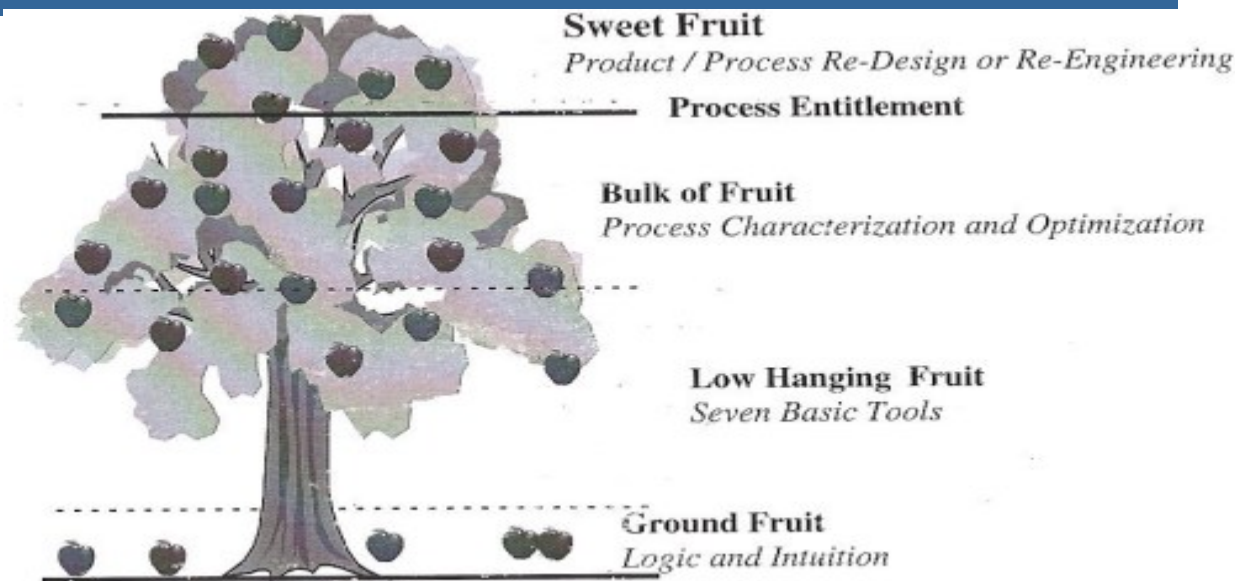
Development/ Certification Process



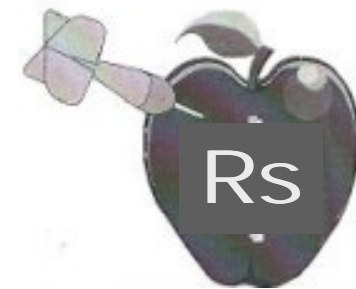
Six Sigma Thought Process and Problem Solving Map



Harvesting the Fruit of Six Sigma



We don't know what we don't know
We can't act on what we don't know
We won't know until we search
We won't search for what we don't question
We don't question what we don't measure
Hence, we don't know



The Role of Questioning

One goal of Six Sigma is to teach us to question conventional thinking.

∅ We must formulate new questions in order to provide new direction and vision

- To reduce variation in our products and processes
- Eliminate defects
- Teach others to do the same

Defect & Variability Reduction

Questions?????

- ∅ Where in the process is the problem occurring?
- ∅ What is the source of the problem?
- ∅ How was the data collected, categorized?
- ∅ Who collected the data?
- ∅ Over what period of time was the data collected?
- ∅ What is the commitment to solve the problem?
- ∅ What are we measuring?
- ∅ Is the measuring system adequate?
- ∅ What factors could affect the process/
- ∅ Do I have between part variation?
- ∅ Is the variation material dependent?
- ∅ How does my material vary?
- ∅ Is my process in control?
- ∅ What are my inputs to the process?
- ∅ What are my critical parameters?
- ∅ Are my critical parameters in control?
- ∅ Are there other factors affecting my process?
- ∅ What is my process?
- ∅ Is my process shifting over time?
- ∅ What is my machine variation?
- ∅ What is my operator variation?
- ∅ How do parts vary over time?
- ∅ Do I have within part variation?

Questions?

- ∅ List 5 questions you have regarding Six Sigma or Belt programs in general:



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