A Competitive Excellence Strategy That Drives the Right Kind of Change

Dr. Mark J. Kiemele
Air Academy Associates

Waterton "Change" Challenge
Bridgend
13 March 2008

Air Academy Associates
Simplify, Perfect, Innovate

Agenda

- The Dilemma of Change
- A Competitive Excellence Strategy
- Necessary Key Principles and Concepts

AIR ACADEMY ASSOCIATES

Simplify, Perfect, Innovate

The Dilemma of Change

"It is not necessary to change. Survival is not mandatory." W. Edwards Deming

"Change is inevitable—except from a vending machine."
Robert C. Gallagher

"Faced with the choice between changing one's mind and proving that there is no need to do so, almost everyone gets busy on the proof." John Kenneth Galbraith

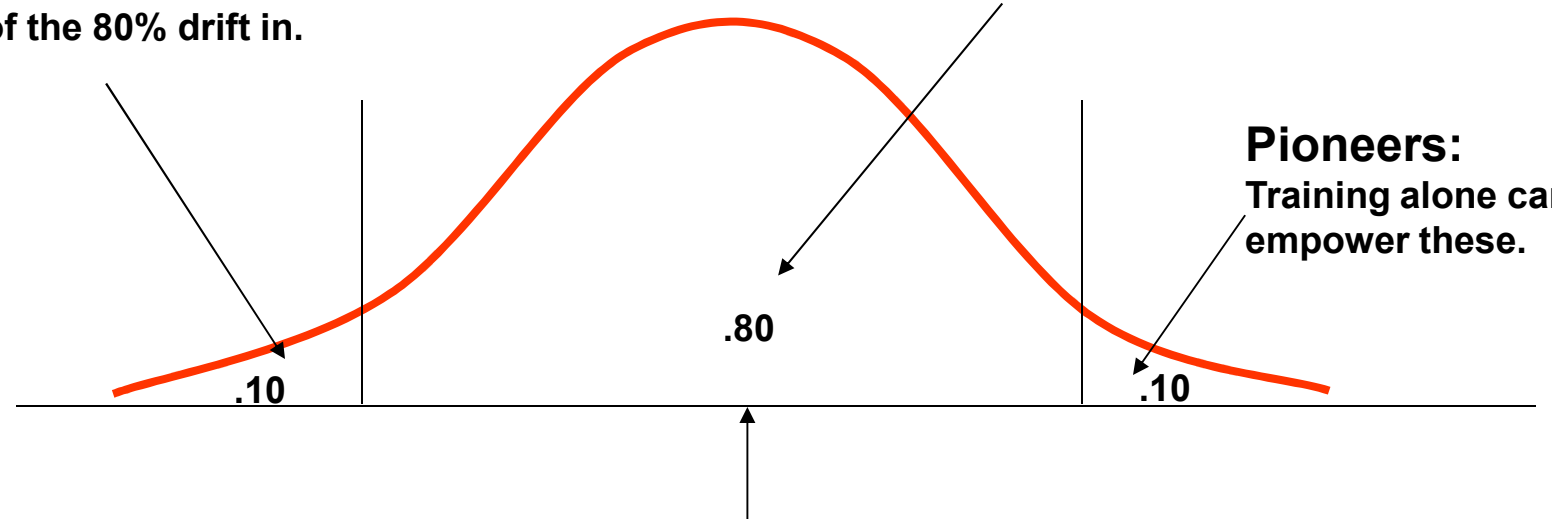
Air Academy Associates
Simplify, Perfect, Innovate

Readiness for Change: the Frontier Model

CAVE People:
Nothing in the world will empower these. Seal off the cave so none of the 80% drift in.

Settlers:
Training alone will not empower these.

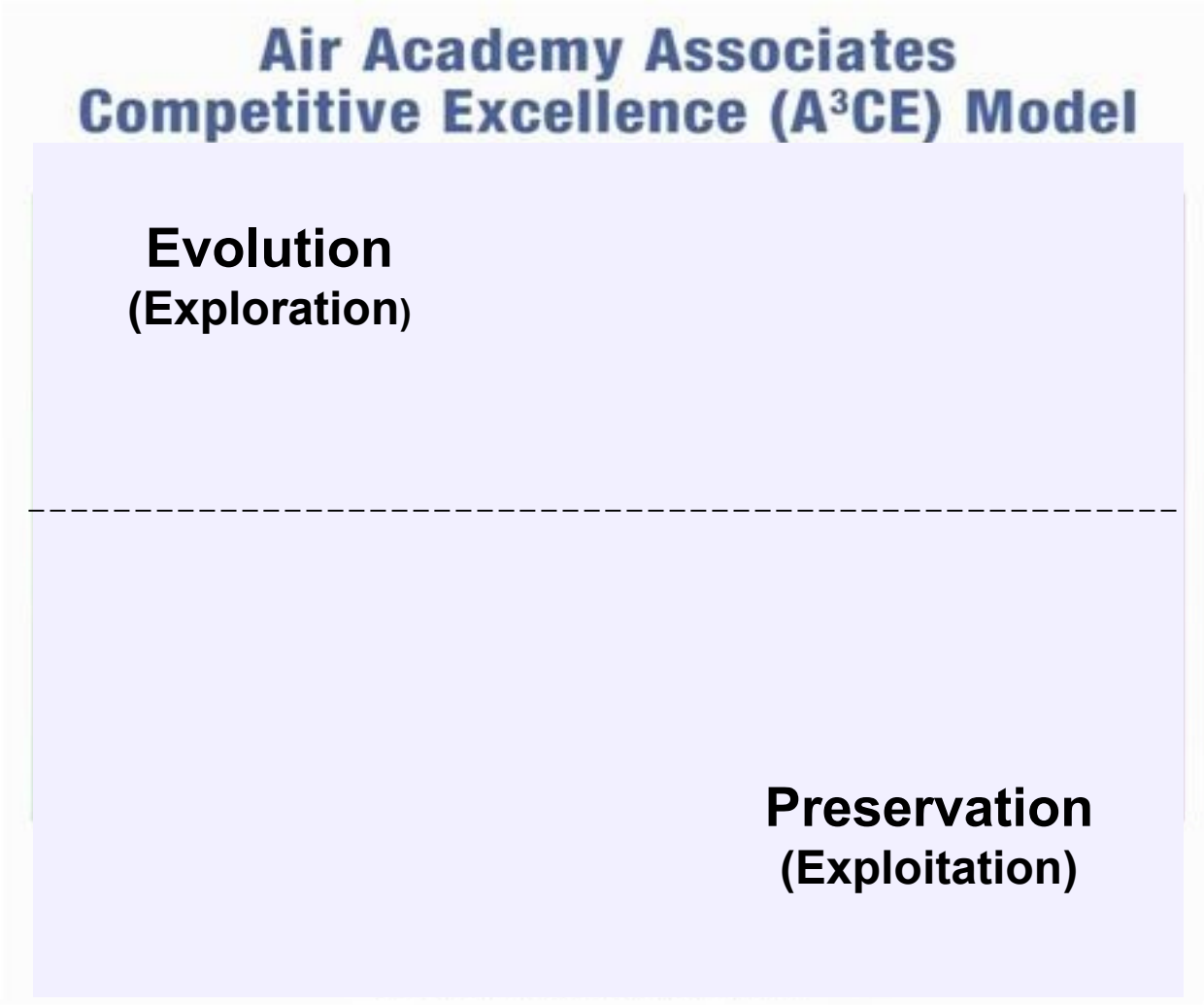
Pioneers:
Training alone can empower these.



To move an organization forward, management must act on these, setting/declaring expectations and aligning the rewards and recognition strategy with accountability and expectations.

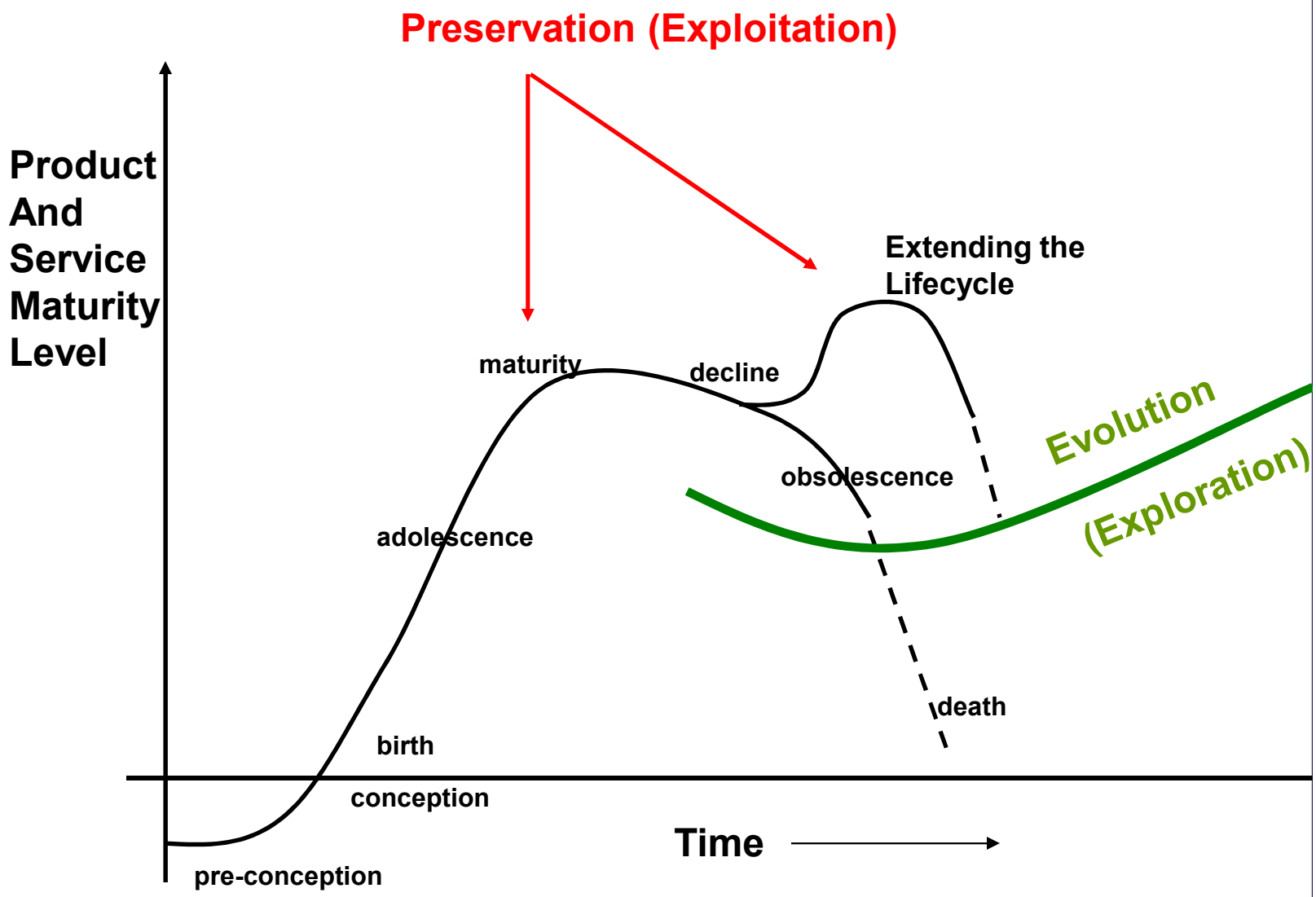
AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Principal Domains in Competitive Excellence



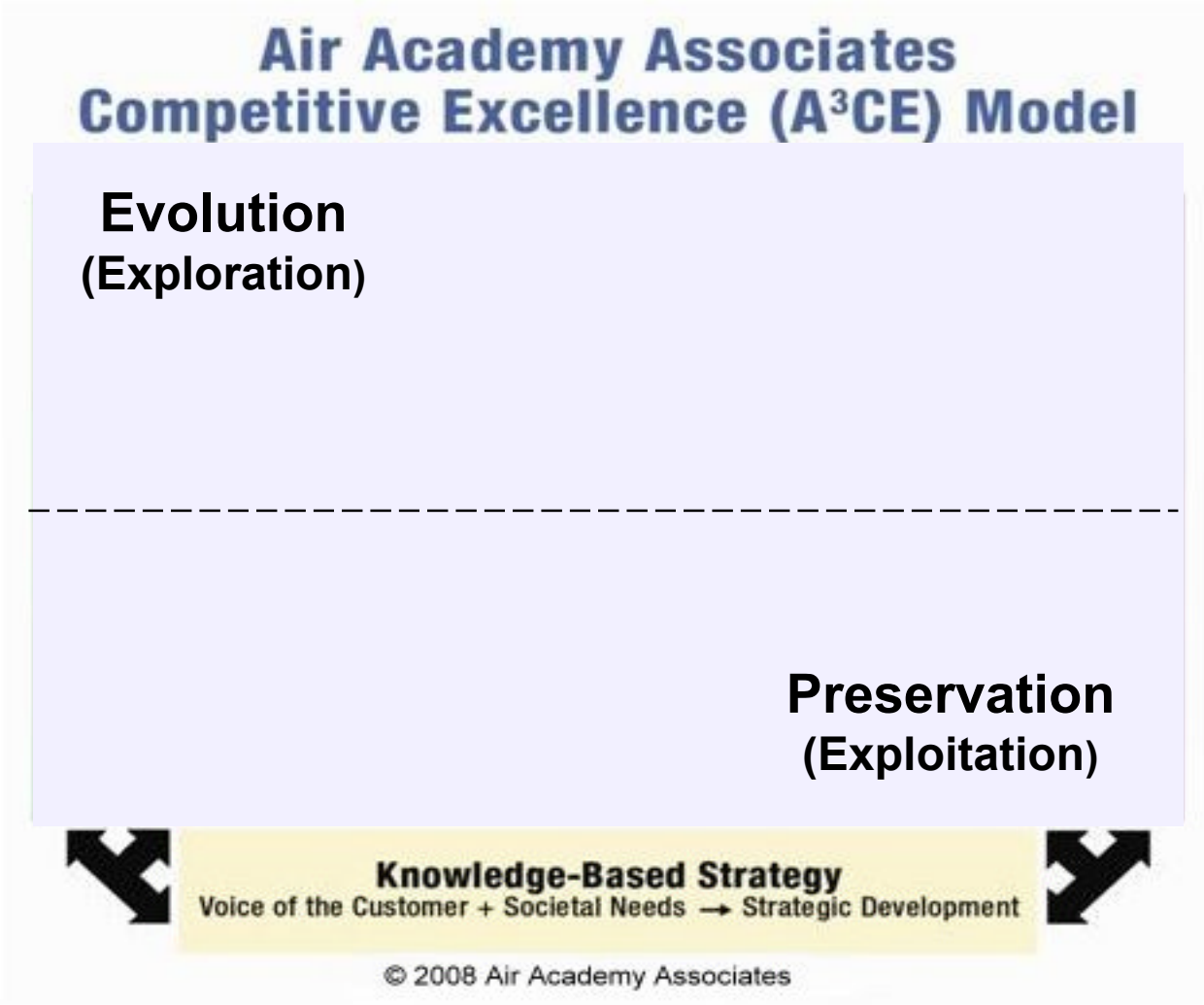
AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Biological S-Curve of Products and Services



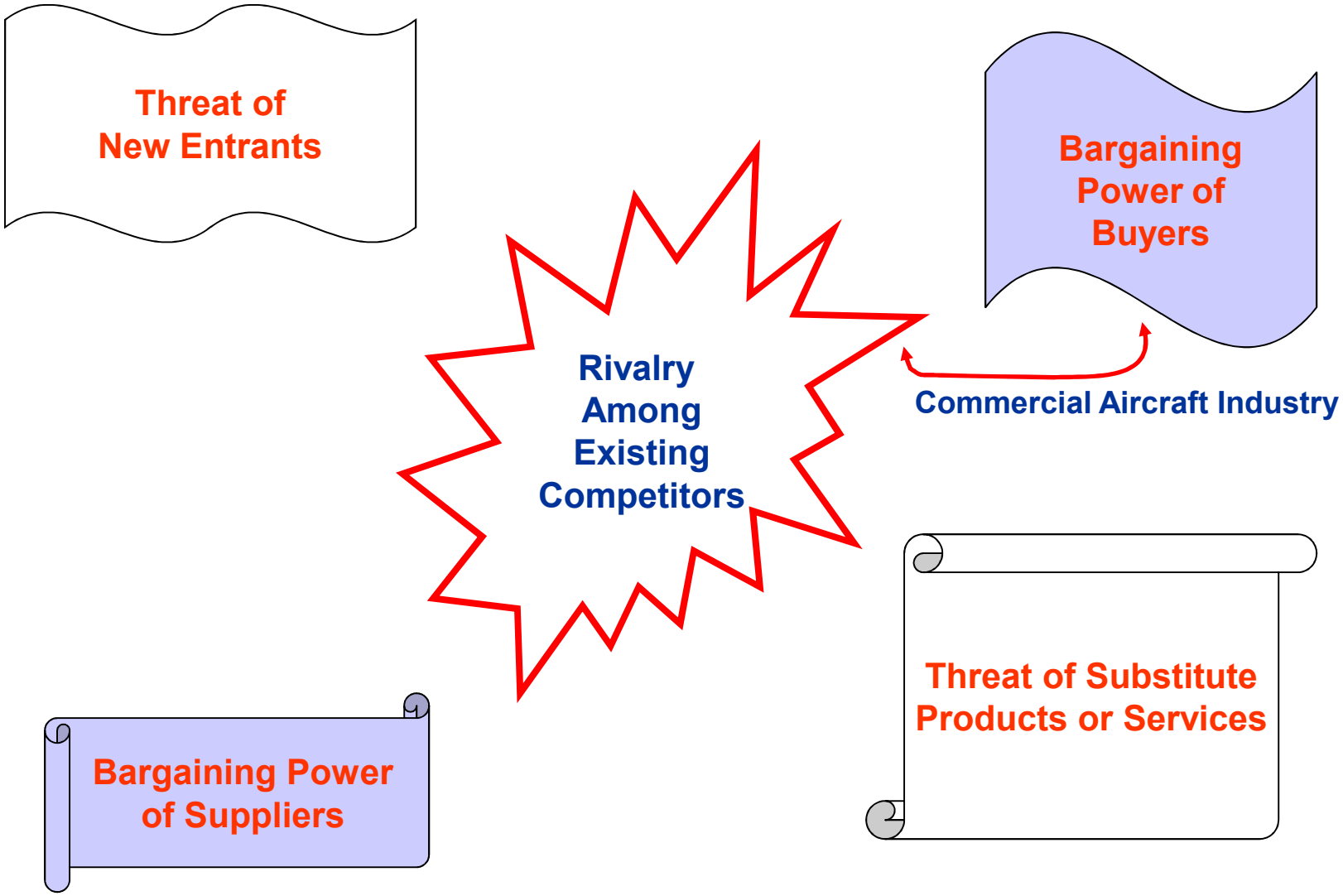
Air Academy Associates
Simplify, Perfect, Innovate

Foundation is a Strategy Based on Knowledge



Air Academy Associates
Simplify, Perfect, Innovate

The Five Forces That Shape Industry Competition

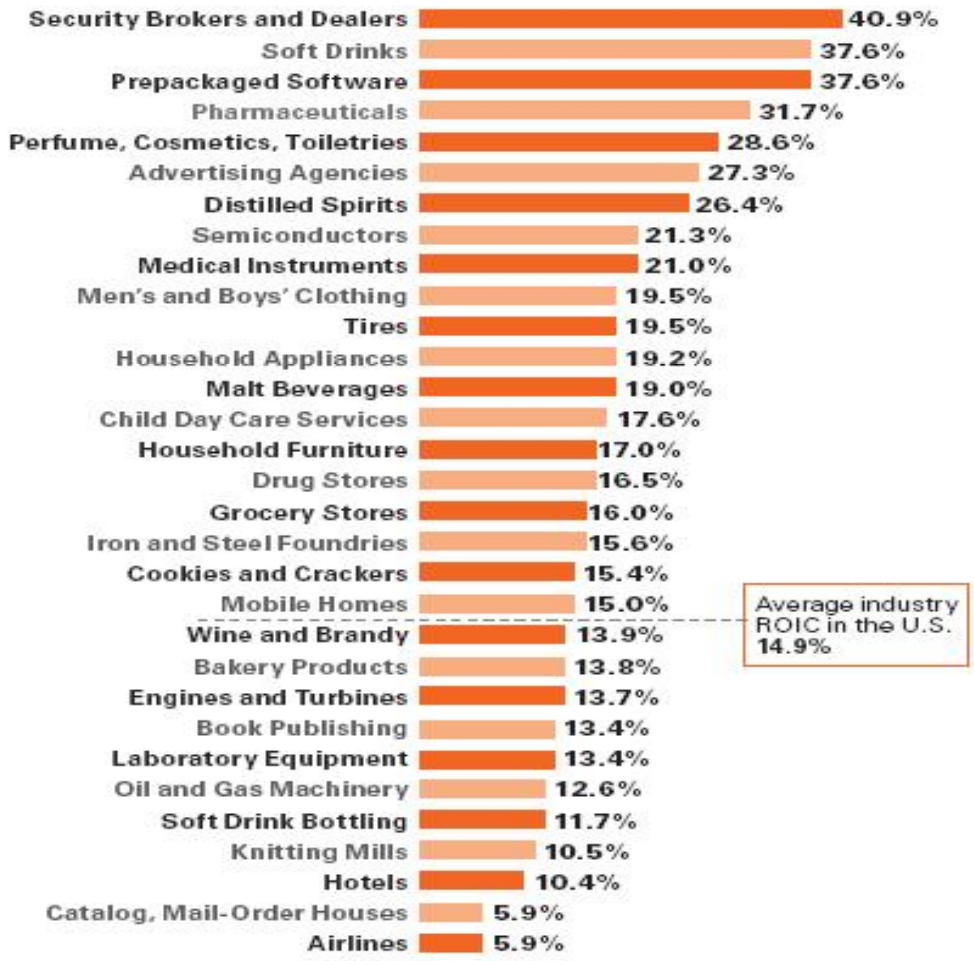


Source: Michael Porter, HBR, January 2008

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Profitability of Selected U.S. Industries

Average ROIC, 1992 - 2006



Source: Michael Porter, HBR, January 2008

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Competitive Excellence

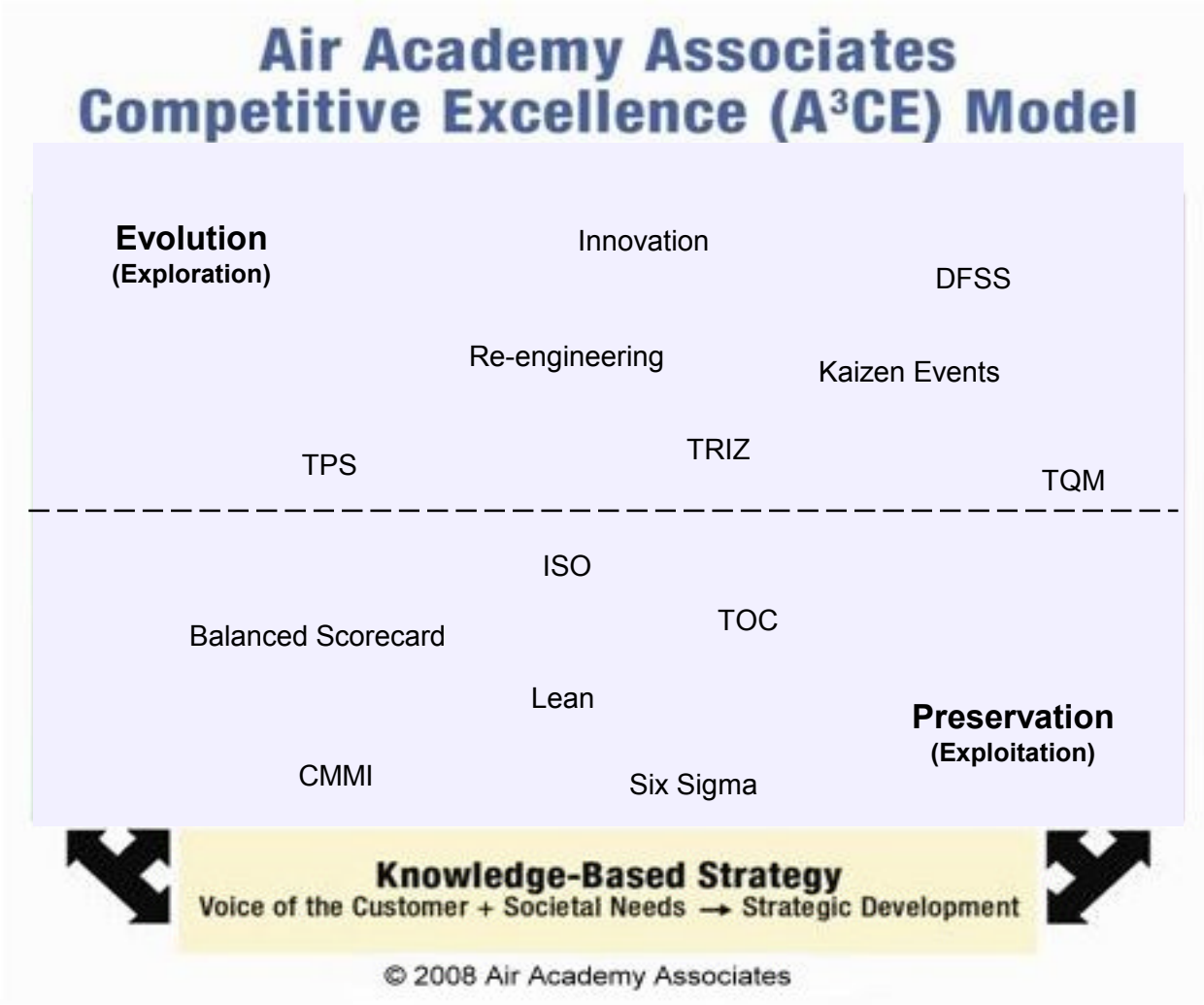
- Means knowledge about and eliminating the constraints throughout the entire concept to commercialization value stream.

Where is the biggest constraint in concept to commercialization?

(1) good concepts	good development	**bad production**
(2) good concepts	**bad development**	good production
(3) **bad concepts**	good development	good production

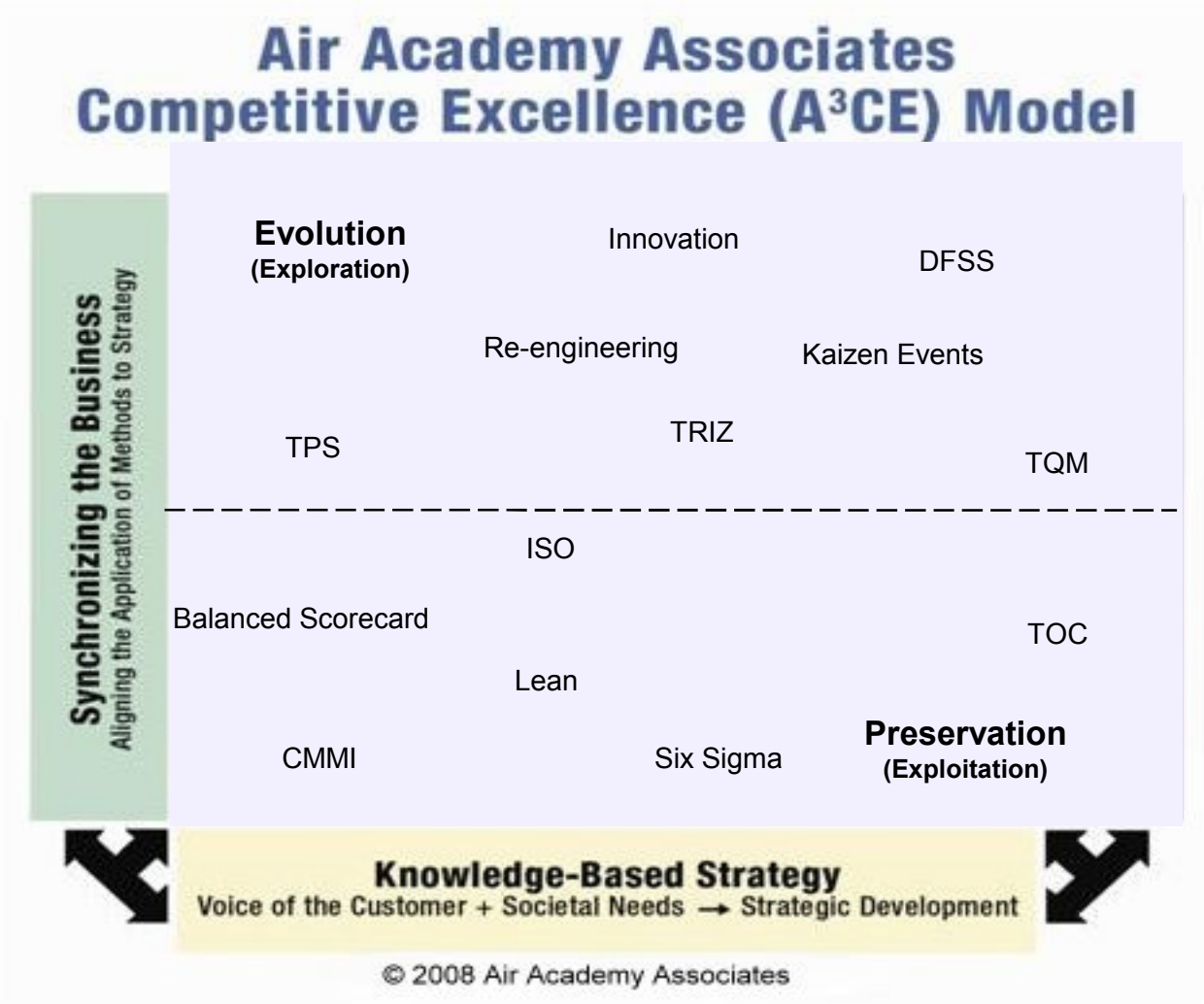
AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Aligning the Initiatives with the Strategy



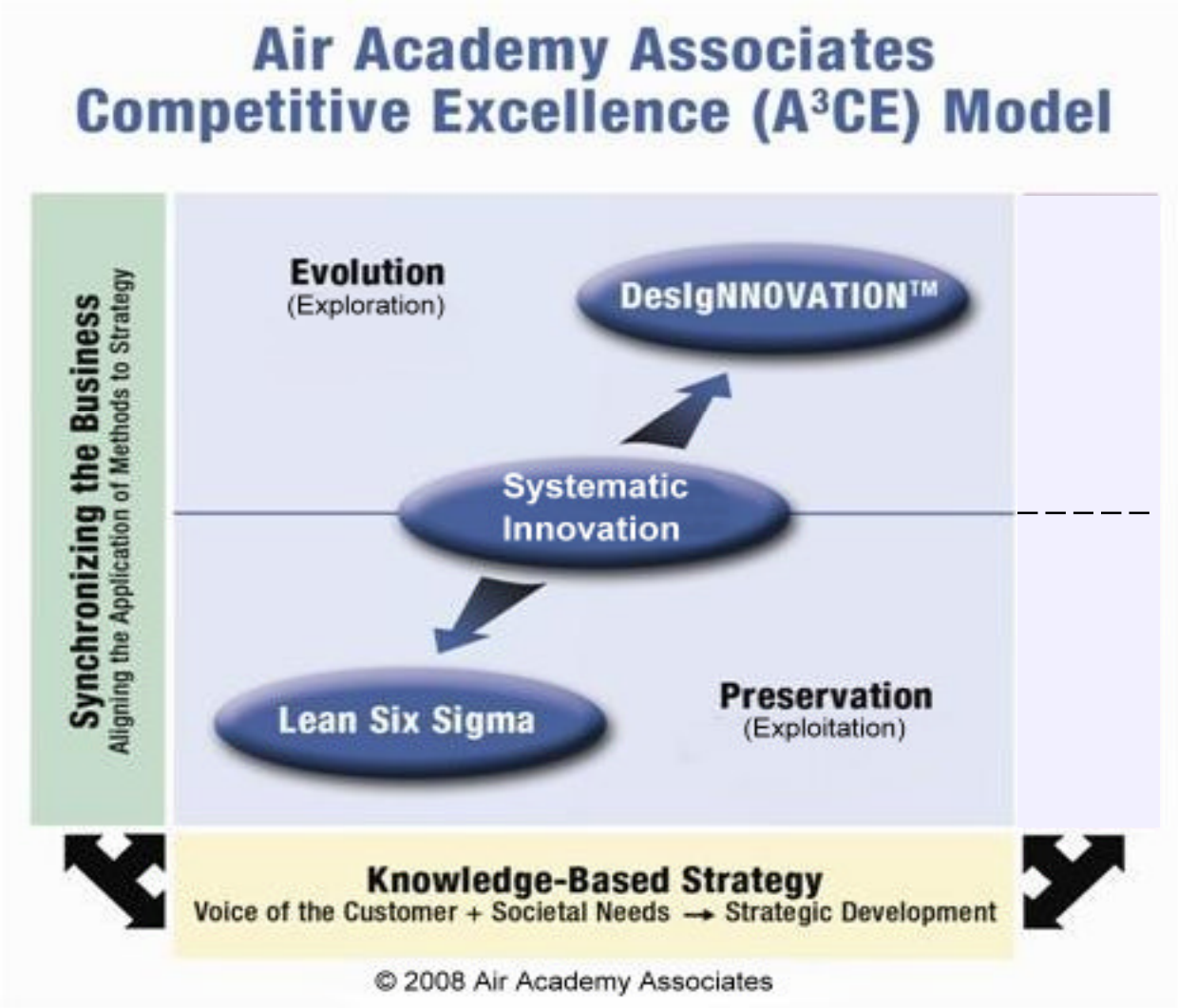
AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Synchronizing



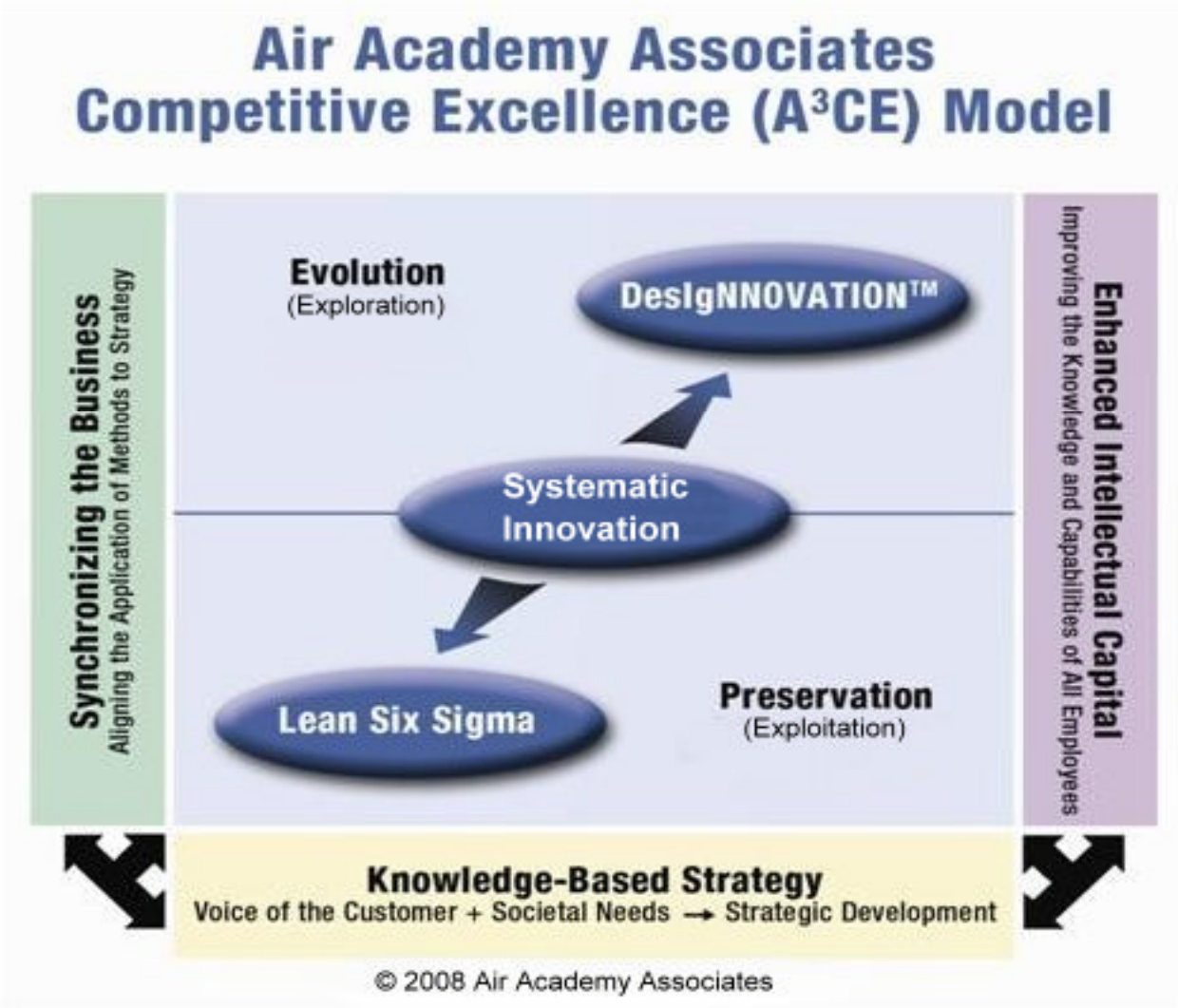
Air Academy Associates
Simplify, Perfect, Innovate

The Result of Synchronization



Simplify, Perfect, Innovate

The Completed Model



Simplify, Perfect, Innovate

Necessary Key Principles and Concepts in Competitive Excellence

- Understanding why Variation is the Enemy
- Separating Signal from Noise
- Knowing the Difference Between Correlation and Causality
- Making Products, Processes, Services, and Strategy Robust to Noise
- Infusing Systematic Innovation

Air Academy Associates
Simplify, Perfect, Innovate

Why is Variation the Enemy?

- Because the customer never sees the average.
- Customers see only the variation in a product or service.

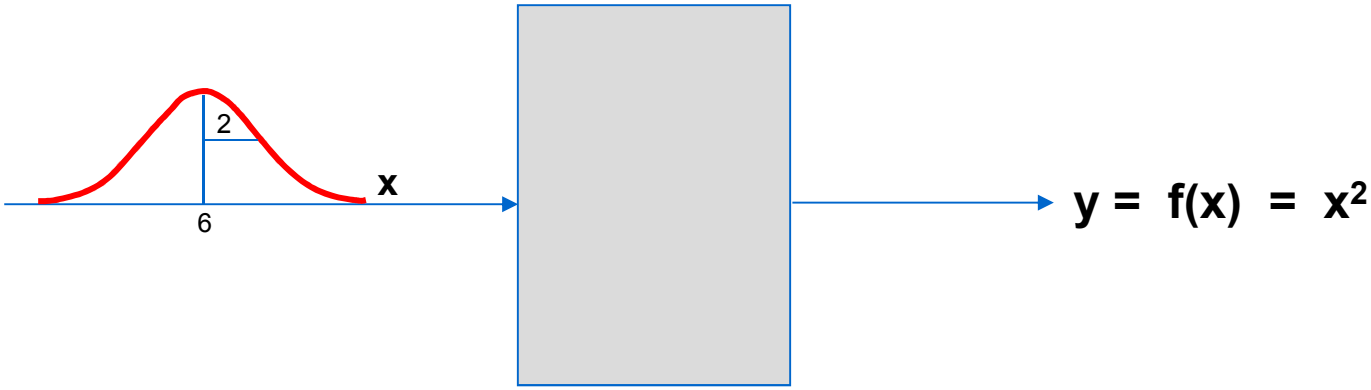
Air Academy Associates
Simplify, Perfect, Innovate

Why is Variation the Enemy?

- Because the customer never sees the average.
- Customers see only the variation in a product or service.
- **Variation creates bias and distorts the truth.**

Air Academy Associates
Simplify, Perfect, Innovate

Expected Value Analysis Example



What is the mean or expected value of the y distribution?

Why is Variation the Enemy?

- Because the customer never sees the average.
- Customers see only the variation in a product or service.
- Variation creates bias and distorts the truth.

"The signature of mediocrity is NOT the inability to change, but chronic inconsistency."

Jim Collins
Author of "Good to Great"

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Separating Signal from Noise

- Being able to distinguish between random variation and special cause
- Separating significant effects from the insignificant ones
- Example: Jim Collins in “Good to Great”
- Example: Human Resources Case Study

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Modeling The Drivers of Turnover

① External Market Factors
(Local Labor Market Conditions)

- Local Unemployment Rate
- Local Employment Alternatives
- Company's Market Share

② Organizational Characteristics
and Practices

- Supervisor Stability
- Lateral / Upward Mobility
- Layoff Climate

③ Employee Attributes

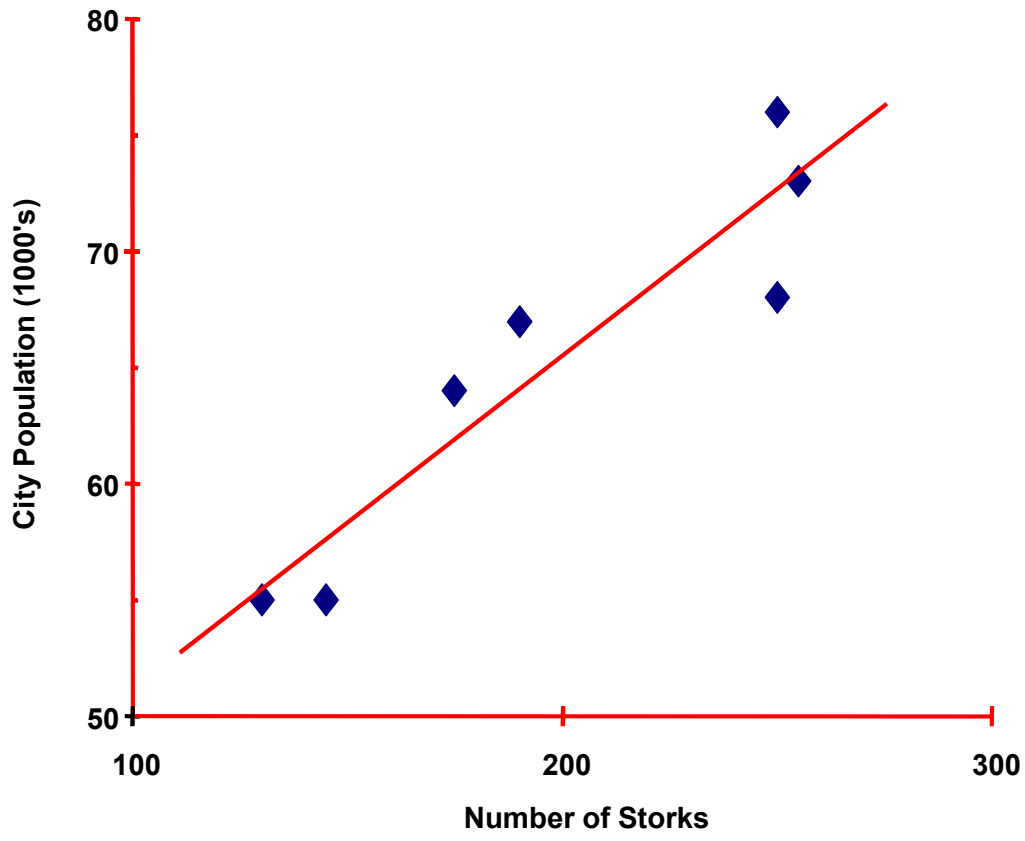
- Time Since Last Promotion
- Education Level
- Job Stability History

Process of Deciding to Stay / Leave

Turnover Rate

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Correlation vs. Causality



A plot of the population of Oldenburg, Germany at the end of each year against the number of storks observed in that year, 1930-1936.

Source: "Statistics for Experimenters" by Box, Hunter, and Hunter. (1978)

AIR ACADEMY ASSOCIATES

Simplify, Perfect, Innovate

Oracle (Best Guess) Approach to Testing

W = Wetting Agent (1=.07 ml; 2=none)

P = Plasticizer (1=1ml; 2=none)

E = Environment (1=Ambient Mixing; 2=Semi-Evacuated)

C = Cement (1=Portland Type III; 2=Calcium Aluminate)

A = Additive (1=No Reinforcement; 2=Steel)

Y = Strength of Lunar Concrete

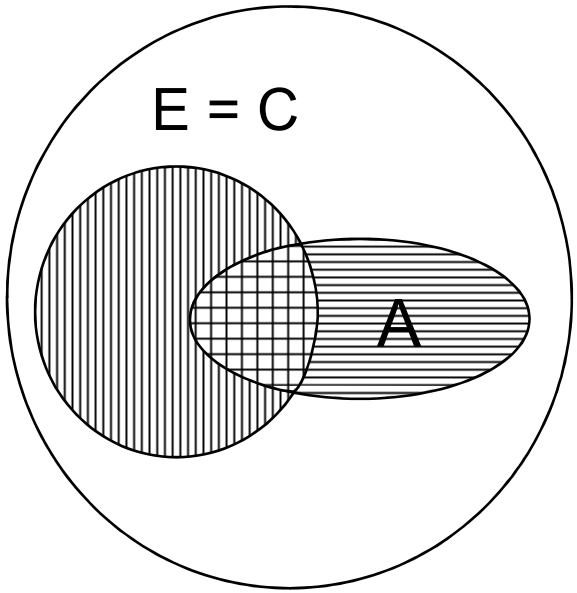
Run	W	P	E	C	A	Y
1	1	2	1	1	1	5
2	1	1	1	1	1	6
3	2	2	1	1	1	5
4	2	1	1	1	2	6
5	1	2	2	2	2	7
6	1	1	2	2	2	8
7	2	2	2	2	2	10
8	2	1	2	2	1	11

AIR ACADEMY ASSOCIATES

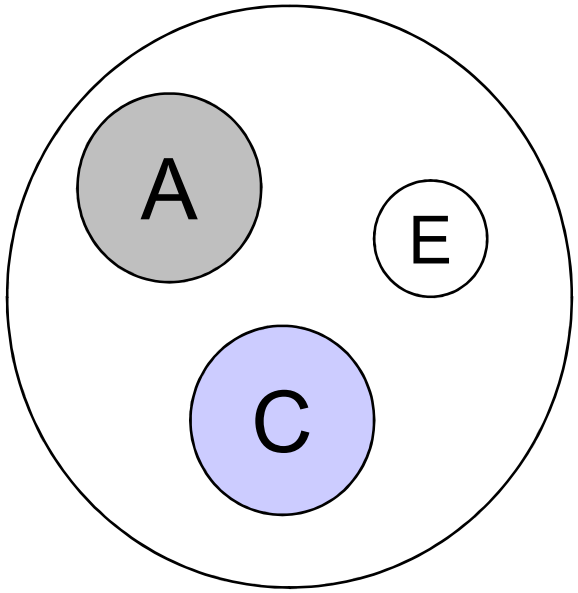
Simplify, Perfect, Innovate

Evaluating the Effects of Variables on Y

What we have is:



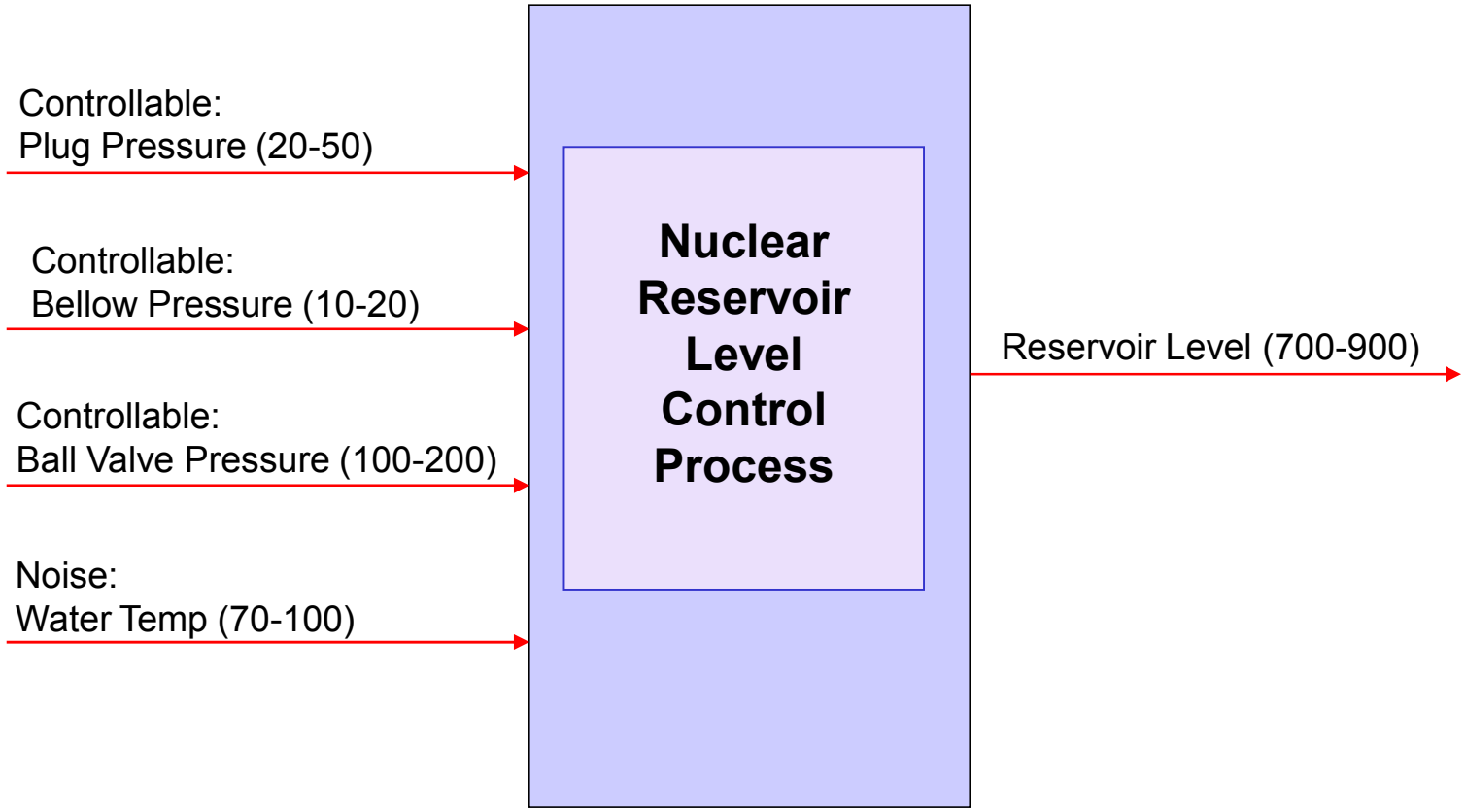
What we need is a design to provide independent estimates of effects:



How do we obtain this independence of effects?

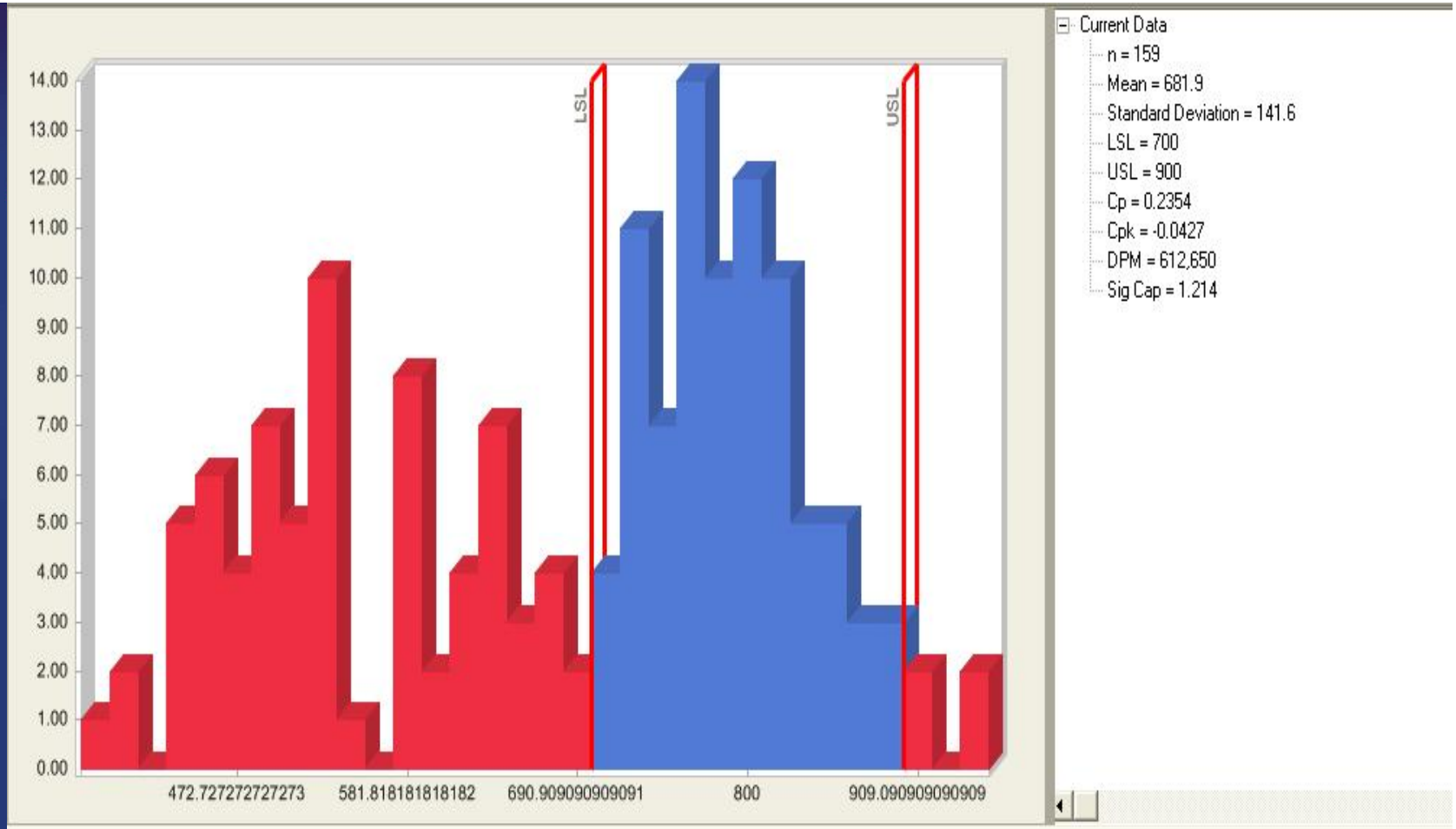
Air Academy Associates
Simplify, Perfect, Innovate

Robust (Parameter) Design Simulation* Example



* From **SimWare Pro** by Philip Mayfield and Digital Computations

Air Academy Associates
Simplify, Perfect, Innovate



Input Controls

Control Set 1

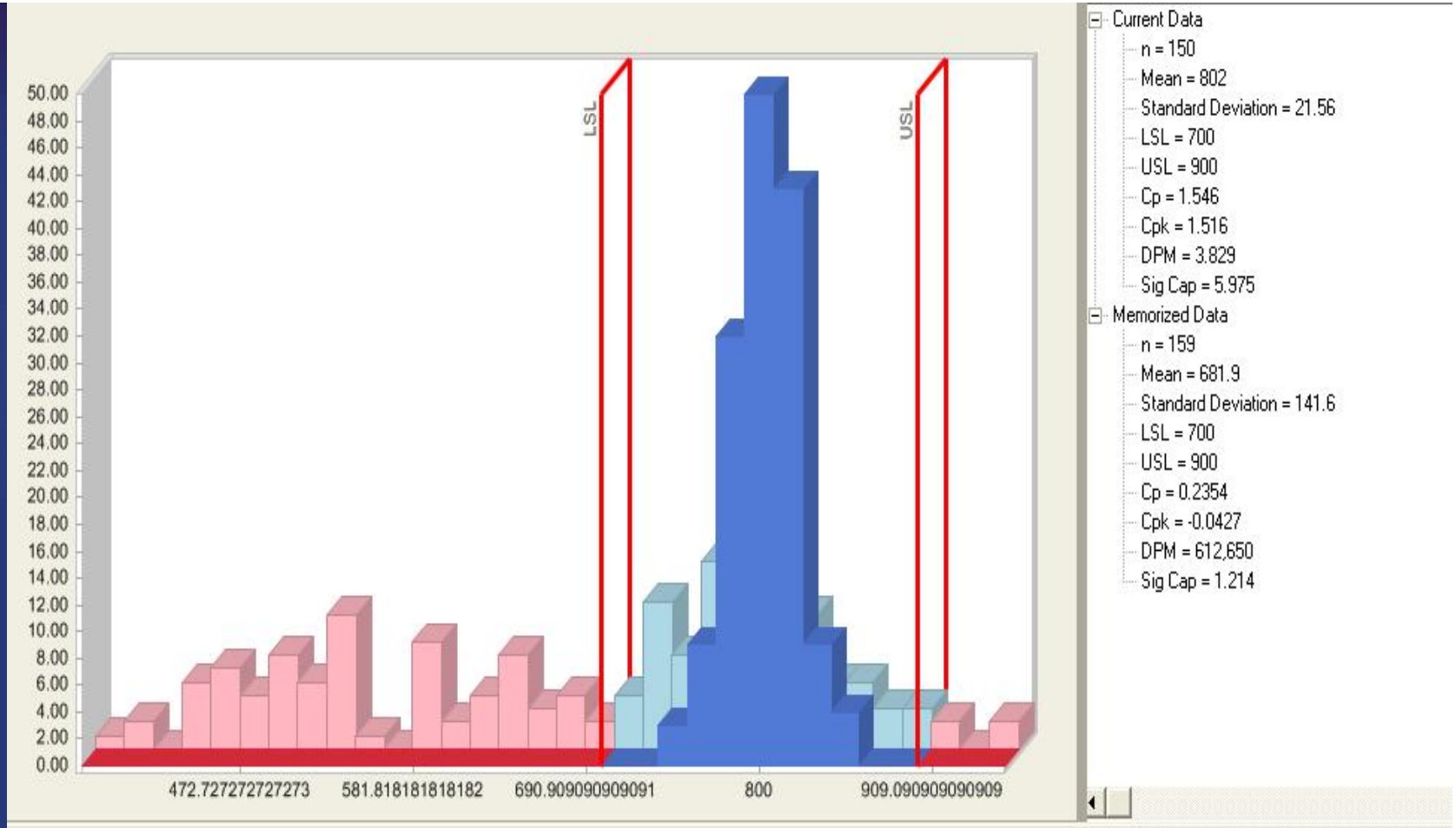
50.0 — Plug Pressure (20 to 50)

12.00 — Bellow Pressure (10 to 20)

145 — Ball Valve Pressure (100 to 200)

AIR ACADEMY ASSOCIATES

Simplify, Perfect, Innovate



Input Controls

Control Set 1

21.0 — Plug Pressure (20 to 50)

20.00 — Bellow Pressure (10 to 20)

137 — Ball Valve Pressure (100 to 200)

Water Temp (Expensive to Control)

AIR ACADEMY ASSOCIATES

Simplify, Perfect, Innovate

Necessary Key Principles and Concepts in Competitive Excellence

- Understanding why Variation is the Enemy
- Separating Signal from Noise
- Knowing the Difference Between Correlation and Causality
- Making Products, Processes, Services, and Strategy Robust to Noise
- **Infusing Systematic Innovation**

Air Academy Associates
Simplify, Perfect, Innovate

An Innovative Conceptual Design Technique (TRIZ: Theory of Inventive Problem Solving)

- TRIZ: Teoriya Resheniya Izobretatelskikh Zadatch
- Founded by Genrich Altshuller (1926 – 1998), a Russian patent inspector, in 1946
- Provides a systematic approach to invention/innovation
- 39 Problem Parameters (Weight, Strength, Temperature, etc…)
- 40 Inventive Principles
- Built a 39 X 39 Contradiction Matrix which is populated by the inventive principles

Source: ***INsourcing Innovation*** by Michael Slocum, et al

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

Altshuller's 39 Problem Parameters

1. Weight of moving object
2. Weight of non-moving object
3. Length of moving object
4. Length of non-moving object
5. Area of moving object
6. Area of non-moving object
7. Volume of moving object
8. Volume of non- moving object
9. Speed
10. Force
11. Tension, pressure
12. Shape
13. Stability of object
14. Strength
15. Durability of moving object
16. Durability of non-moving object
17. Temperature
18. Brightness
19. Energy spent by moving object
20. Energy spent by non-moving object
21. Power
22. Waste of energy
23. Waste of substance
24. Loss of information
25. Waste of time
26. Amount of substance
27. Reliability
28. Accuracy of measurement
29. Accuracy of manufacturing
30. Harmful factors acting on object
31. Harmful side effects
32. Manufacturability
33. Convenience of use
34. Repairability
35. Adaptability
36. Complexity of device
37. Complexity of control
38. Level of automation
39. Productivity

Source: ***INsourcing Innovation*** by Michael Slocum, et al

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

40 Inventive Principles

1. Segmentation
2. Extraction
3. Local Conditions
4. Asymmetry
5. Combining
6. Universality
7. Nesting
8. Counterweight
9. Prior Counter-action
10. Prior Action
11. Cushion In Advance
12. Equipotentiality
13. Inversion
14. Spheroidality
15. Dynamicity
16. Partial Or Overdone Action
17. Moving To A New Dimension
18. Mechanical Vibration
19. Periodic Action
20. Continuity Of Useful Action
21. Rushing Through
22. Convert Harm Into Benefit
23. Feedback
24. Mediator
25. Self-service
26. Copying
27. An Inexpensive Short-life Object Instead Of An Expensive Durable One
28. Replacement Of A Mechanical System
29. Use A Pneumatic Or Hydraulic Construction
30. Flexible Film Or Thin Membranes
31. Use Of Porous Material
32. Changing The Color
33. Homogeneity
34. Rejecting And Regenerating Parts
35. Transformation Of Physical And Chemical States Of An Object
36. Phase Transition
37. Thermal Expansion
38. Using Strong Oxidizers
39. Inert Environment
40. Composite Materials

Source: ***INsourcing Innovation*** by Michael Slocum, et al

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

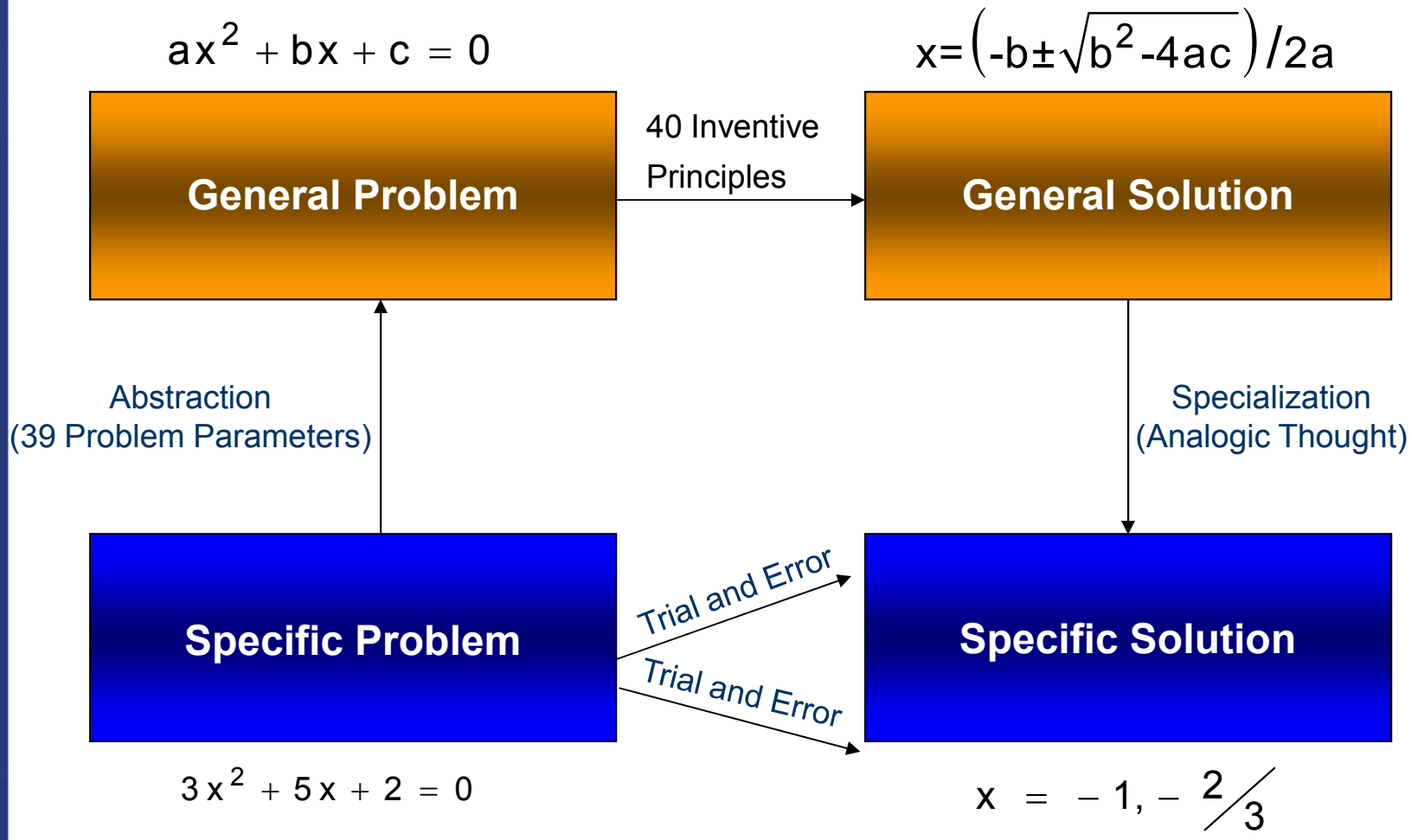
Contradiction Matrix Cross Section

Problem Parameters		Problem Parameters	
Problem Parameters	Harmful Features / Useful Features	2 Weight of Non-Moving Object	8 Volume of Non-Moving Object
	14 Strength	40, 26, 27, 1	9, 14, 17, 15
	17 Temperature	22, 35 32	35, 6 4
	33 Convenience of Use	6, 13 1, 25	4, 18, 39, 31
		Inventive Principles	

Source: ***INsourcing Innovation*** by Michael Slocum, et al

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

TRIZ Problem-Solving Method



Air Academy Associates

Simplify, Perfect, Innovate

Key Take-Aways

- Much too often, luck is misinterpreted as skill.
- All of us at one time or another are fooled by randomness.
- It is not a sin to be affected by noise, but it is a sin not to know how to go about separating fact from fiction and then doing so.
- The growth in available information has been exceeded only by the expansion of noise.
- Science has only recently begun its fight against randomness.
- A powerful Competitive Excellence Strategy with all the necessary parts is the first step in fighting through this "halo" of noise and randomness.
- Get the facts! It is difficult to make good decisions if one cannot tell the difference between opinion and fact.

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

For More Information, Please Reference

Website: www.airacad.com

Toll Free: (800) 748-1277 or (719) 531-0777

Facsimile: (719) 531-0778

Email: mkiemele@airacad.com

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate

AIR ACADEMY ASSOCIATES
Simplify, Perfect, Innovate