A Competitive Excellence Strategy That Drives the Right Kind of Change

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Air Academy Associates

Waterton “Change” Challenge
Bridgend
13 March 2008
Agenda

• The Dilemma of Change

• A Competitive Excellence Strategy

• Necessary Key Principles and Concepts
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
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.
Principal Domains in Competitive Excellence

Evolution
(Exploration)

Preservation
(Exploitation)
Biological S-Curve of Products and Services

Preservation (Exploitation)

Evolution (Exploration)

Birth

Adolescence

Maturity

Decline

Obsolescence

Death

Pre-conception

Conception

Time

Product and Service Maturity Level

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Foundation is a Strategy Based on Knowledge

Air Academy Associates
Competitive Excellence (A³CE) Model

Evolution
(Exploration)

Preservation
(Exploitation)

Knowledge-Based Strategy
Voice of the Customer + Societal Needs → Strategic Development

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The Five Forces That Shape Industry Competition

Rivalry Among Existing Competitors

Threat of New Entrants

Bargaining Power of Suppliers

Bargaining Power of Buyers

Threat of Substitute Products or Services

Commercial Aircraft Industry

Source: Michael Porter, HBR, January 2008
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
Aligning the Initiatives with the Strategy

Air Academy Associates
Competitive Excellence (A³CE) Model

Evolution
(Exploration)

Innovation

Re-engineering

Kaizen Events

Preservation
(Exploitation)

TPS

TRIZ

TQM

Balanced Scorecard

ISO

TOC

Lean

CMMI

Six Sigma

DFSS

Knowledge-Based Strategy
Voice of the Customer + Societal Needs → Strategic Development
Synchronizing

Air Academy Associates
Competitive Excellence (A³CE) Model

Evolution
(Exploration)

Innovation

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Kaizen Events

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Balanced Scorecard

ISO

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CMMI

Six Sigma

Preservation
(Exploitation)
The Result of Synchronization

Air Academy Associates
Competitive Excellence (A³CE) Model

Synchronizing the Business
Aligning the Application of Methods to Strategy

Evolution
(Exploration)

DesIGNNOVATION™

Systematic Innovation

Preservation
(Exploitation)

Lean Six Sigma

Knowledge-Based Strategy
Voice of the Customer + Societal Needs → Strategic Development

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The Completed Model

Air Academy Associates
Competitive Excellence (A³CE) Model

Evolution
(Exploration)

DesIgNNOVATION™

Systematic Innovation

Preservation
(Exploitation)

Enhanced Intellectual Capital
Improving the Knowledge and Capabilities of All Employees

Synchronizing the Business
Aligning the Application of Methods to Strategy

Lean Six Sigma

Knowledge-Based Strategy
Voice of the Customer + Societal Needs → Strategic Development

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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
Why is Variation the Enemy?

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

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<th>P</th>
<th>E</th>
<th>C</th>
<th>A</th>
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<td>1</td>
<td>11</td>
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Evaluating the Effects of Variables on $Y$

What we have is:

$E = C$

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

How do we obtain this independence of effects?
Robust (Parameter) Design Simulation* Example

Controllable:
- Plug Pressure (20-50)
- Bellow Pressure (10-20)
- Ball Valve Pressure (100-200)

Noise:
- Water Temp (70-100)

Nuclear Reservoir Level Control Process

Reservoir Level (700-900)

* From SimWare Pro by Philip Mayfield and Digital Computations
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
An Innovative Conceptual Design Technique
(TRIZ: Theory of Inventive Problem Solving)

- TRIZ: Teoriya Resheniya Izobretatel’skih 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

## Altshuller’s 39 Problem Parameters

<p>| | | | |</p>
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<tbody>
<tr>
<td>1.</td>
<td>Weight of moving object</td>
<td>14.</td>
<td>Strength</td>
</tr>
<tr>
<td>2.</td>
<td>Weight of non-moving object</td>
<td>15.</td>
<td>Durability of moving object</td>
</tr>
<tr>
<td>3.</td>
<td>Length of moving object</td>
<td>16.</td>
<td>Durability of non-moving object</td>
</tr>
<tr>
<td>4.</td>
<td>Length of non-moving object</td>
<td>17.</td>
<td>Temperature</td>
</tr>
<tr>
<td>5.</td>
<td>Area of moving object</td>
<td>18.</td>
<td>Brightness</td>
</tr>
<tr>
<td>9.</td>
<td>Speed</td>
<td>22.</td>
<td>Waste of energy</td>
</tr>
<tr>
<td>11.</td>
<td>Tension, pressure</td>
<td>24.</td>
<td>Loss of information</td>
</tr>
<tr>
<td>12.</td>
<td>Shape</td>
<td>25.</td>
<td>Waste of time</td>
</tr>
<tr>
<td>27.</td>
<td>Reliability</td>
<td>28.</td>
<td>Accuracy of measurement</td>
</tr>
<tr>
<td>29.</td>
<td>Accuracy of manufacturing</td>
<td>31.</td>
<td>Harmful side effects</td>
</tr>
<tr>
<td>32.</td>
<td>Manufacturability</td>
<td>33.</td>
<td>Convenience of use</td>
</tr>
<tr>
<td>34.</td>
<td>Repairability</td>
<td>35.</td>
<td>Adaptability</td>
</tr>
<tr>
<td>36.</td>
<td>Complexity of device</td>
<td>37.</td>
<td>Complexity of control</td>
</tr>
<tr>
<td>38.</td>
<td>Level of automation</td>
<td>39.</td>
<td>Productivity</td>
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## 40 Inventive Principles

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<tr>
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<tbody>
<tr>
<td>1.</td>
<td>Segmentation</td>
<td>18.</td>
<td>Mechanical Vibration</td>
<td>30.</td>
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<tr>
<td>5.</td>
<td>Combining</td>
<td>22.</td>
<td>Convert Harm Into Benefit</td>
<td>34.</td>
</tr>
<tr>
<td>12.</td>
<td>Equipotentiality</td>
<td>29.</td>
<td>Use A Pneumatic Or Hydraulic Construction</td>
<td></td>
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<tr>
<td>13.</td>
<td>Inversion</td>
<td></td>
<td></td>
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<tr>
<td>14.</td>
<td>Spheroidality</td>
<td></td>
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<tr>
<td>15.</td>
<td>Dynamicity</td>
<td></td>
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<tr>
<td>16.</td>
<td>Partial Or Overdone Action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Moving To A New Dimension</td>
<td></td>
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</table>

Source: *INsourcing Innovation* by Michael Slocum, et al
## Contradiction Matrix Cross Section

<table>
<thead>
<tr>
<th>Problem Parameters</th>
<th>2 Weight of Non-Moving Object</th>
<th>8 Volume of Non-Moving Object</th>
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</thead>
<tbody>
<tr>
<td><strong>Problem Parameters</strong></td>
<td><strong>Useful Features</strong></td>
<td><strong>Harmful Features</strong></td>
</tr>
<tr>
<td>14 Strength</td>
<td>40, 26, 27, 1</td>
<td>9, 14, 17, 15</td>
</tr>
<tr>
<td>17 Temperature</td>
<td>22, 35, 32</td>
<td>35, 6, 4</td>
</tr>
<tr>
<td>33 Convenience of Use</td>
<td>6, 13, 1, 25</td>
<td>4, 18, 39, 31</td>
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</tbody>
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TRIZ Problem-Solving Method

\[ ax^2 + bx + c = 0 \]

\[ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \]

General Problem

\[ 3x^2 + 5x + 2 = 0 \]

Specific Problem

\[ x = -1, -\frac{2}{3} \]

Specific Solution

Abstraction (39 Problem Parameters)

40 Inventive Principles

General Solution

Specialization (Analogic Thought)

Trial and Error

Simplify, Perfect, Innovate

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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.
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