Enhance Business Innovation With TRIZ
October 20, 2008 The Performance Conference, Las Vegas

Ellen Domb
PQR Group
Founding Editor, The TRIZ Journal

The PQR Group
190 N. Mountain Ave.,
Upland CA 91786 USA
+1 (909)949-0857

http://www.triz-journal.com
http://www.trizpqrgroup.com
ellendomb@trizpqrgroup.com

TRIZ = Theory of Inventive Problem Solving

TRIZ is a Russian acronym
- 1946-85. Originated in work of G. Altshuller and others in the USSR
- 1980’s. Global expansion of use and research
- Late 1990’s. Incorporated into Six Sigma and other quality disciplines

TRIZ is pronounced like “trees”

www.triz-journal.com
- case studies, tutorials, theory, research

© 2008. Ellen Domb. +1 (909) 949-0857 ellendomb@trizpqrgroup.com
Why Is Problem Solving Part of Business Innovation?

- If the customer has the problem, the solution is called
  - New business
  - New Product
  - New Service
  - New hybrid service/product
- If the company has the problem, the solution is called
  - Management Innovation
  - Six Sigma or Business Process Reengineering or ..
  - Innovation

Why Add TRIZ to Six Sigma?

- **DMAIC:** Root cause analysis doesn’t always tell you how to get rid of the root cause
- **DFSS:** Voice of the Customer doesn’t tell you how to design a product/service that will satisfy the customer’s needs
- **Deployment:** Creative approach required
Why Add TRIZ to Project Management?

• Innovation is needed to remove risk
• Innovation is needed to meet schedule
• Innovation is needed!

Two Culturally-Shocking, Underlying TRIZ Concepts

1. Somebody, someplace has already solved your problem, or one very similar. Creativity is finding that solution and modifying it to fit your circumstances

2. Don’t accept compromises. Remove the source of the problem.
There Are 2 Kinds of Contradictions

- **Technical Contradictions**
  - “Trade-offs”
  - Something gets better, something else gets worse
  - Use the matrix and the 40 principles

- **Physical Contradictions**
  - “Inherent Contradictions”
  - One object has contradictory (opposite) requirements.
  - Use the separation principles

<table>
<thead>
<tr>
<th>Improves</th>
<th>22</th>
<th>Degraded</th>
<th>6,14</th>
</tr>
</thead>
</table>

Use the Matrix

www.triz-journal.com

<table>
<thead>
<tr>
<th>Worsening Feature</th>
<th>Improving Feature</th>
<th>Weight of moving object</th>
<th>Weight of stationary object</th>
<th>Length of moving object</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress or pressure</td>
<td>10, 36, 37, 40</td>
<td>13, 29, 10, 18</td>
<td>35, 10, 36</td>
<td></td>
</tr>
<tr>
<td>Shape</td>
<td>8, 10, 29, 40</td>
<td>15, 10, 26, 3</td>
<td>29, 34, 5, 4</td>
<td></td>
</tr>
<tr>
<td>Stability of the object's composition</td>
<td>21, 35, 2, 39</td>
<td>26, 39, 1, 40</td>
<td>13, 15, 1, 28</td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td>1, 8, 40, 15</td>
<td>40, 26, 27, 1</td>
<td>40, 26, 27, 1</td>
<td></td>
</tr>
<tr>
<td>Duration of action of moving object</td>
<td>19, 5, 34, 31</td>
<td>-</td>
<td>2, 19, 9</td>
<td>-</td>
</tr>
<tr>
<td>Duration of action by stationary object</td>
<td>-</td>
<td>6, 27, 19, 16</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Temperature</td>
<td>36, 22, 6, 38</td>
<td>22, 35, 32</td>
<td>15, 19, 9</td>
<td></td>
</tr>
</tbody>
</table>

40,26, 27, 1

Then go to the 40 Principles for solution concepts
Examples of 40 Principles

• 40—Use composite materials
• 26—Use images or optical copies, change the wavelength of an image.
• 27—Use cheap disposable parts
• 1—Segmentation. Divide the system into parts. If it is already in parts, make them smaller.

There Are 2 Kinds of Contradictions

• Technical Contradictions
  ➢ “Trade-offs”
  ➢ Something gets better, something else gets worse
  ➢ Use the matrix and the 40 principles

• Physical Contradictions
  ➢ “Inherent Contradictions
  ➢ One object has contradictory (opposite) requirements.
  ➢ Use the separation principles

<table>
<thead>
<tr>
<th>Improves</th>
<th>6, 14, 22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot/cold</td>
<td>Soft/hard</td>
</tr>
<tr>
<td>Time consuming/instant</td>
<td>Present/absent</td>
</tr>
</tbody>
</table>
Resolve Physical Contradictions 4 Ways

1. Separation of the requirements in time
2. Separation of the requirements in space
3. Coexistence of the contradictory properties, in different sub-systems or different regions of phase space.
4. Solve the problem in the super-system or the sub-system (as in the System Operator)

Try Both Ways

Physical Contradiction
Separation Principles

Technical Contradiction
40 Inventive Principles
Who Does What with TRIZ?

• Siemens
• Samsung
• General Electric
• Hewlett-Packard
• Intel
• Ford
• Dow Chemical Co.
• SC Johnson
• Johnson & Johnson
• IBM
• Procter & Gamble
• Mexican University Systems
  ➢ TEC, Puebla, technical universities
• INSA (France)
• Fraunhofer Institute
• NC State University
• Wayne State University
• UCLA
• USC
• Dubai and Saudi Arabia new technical universities
• Hundreds of small and middle-sized companies in India, China, North America, Europe, and the Middle East.

July 2007 ISixSigma Magazine

Karen Trzcinski,
Corporate Director of Six Sigma
Tom Kling,
MBB R&D
**“Tying Lean Six Sigma to Strategy”**

**Six Market Growth Paths**

<table>
<thead>
<tr>
<th>Core Jobs(s)</th>
<th>Other Jobs(s)</th>
<th>Core or Sustaining Market Growth</th>
<th>Related Market Growth</th>
<th>New Platform Creation</th>
<th>Core Platform Disruption</th>
<th>Related Growth in a Disrupted Market</th>
<th>Core Market Disruption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add a set of features to the core platform to help customers get a core job or jobs done.</td>
<td>Add a set of features to the core platform to help customers get a related job or jobs done.</td>
<td>Construct a feature set on a new platform to help customers get a core job and related jobs done better.</td>
<td>Add a set of features to the core platform to help customers get a core job or jobs done better.</td>
<td>Construct a feature set on a new platform to help customers get a core job or jobs done cheaper and/or better.</td>
<td>Construct a feature set on a new platform to enable new customers to perform the core job of a specialist.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on research by Strategyn and PQR Group, 2008

---

**Next Steps**

- Apply TRIZ to *any* innovative situation.
- Read and contribute to *The TRIZ Journal*
  
  [http://www.triz-journal.com](http://www.triz-journal.com)
- Integrate TRIZ with all Business Innovation elements