

# TRIZ Usage Day-to-Day Overview and Exercise

David W. Conley



# TRIZ Activities

- Engineering Program Manager - **Intel**
  - TRIZ Projects
    - Technical and Business
  - TRIZ Program Development
    - Organization Integration
    - Program Integration (ex. TRIZ and Lean)
  - TRIZ Training
  - Competitive Analysis
- Executive Committee Member - **Altshuller Institute for TRIZ Studies**
- Consultant - **Innomation, LLC**



# Agenda/Overview

1. Communicate 2008 *Organization* TRIZ Usage Objective
2. Summarize Process Towards Achieving Objective
3. Discuss TRIZ Usage Techniques Currently Employed within the *Organization*
4. Capture Focused Brainstorming While Demonstrating One Technique - Drive by Consulting

# 1. Communicate 2008 *Organizational* TRIZ Usage Objective

- Improve utilization of TRIZ
  - Quantitative – how many people are utilizing the tools?
  - Qualitative – how well are the tools being used?
  - Blending – are we using TRIZ effectively in conjunction with other methods?
    - Lean, HPM, 6 Sigma

# Summarize Process Towards Achieving Objective

- Understand where we are:
  - Customer services (i.e., *organization* process engineers)
  - TRIZ practitioner support (support of our L1,2,and 3 practitioners)
  - TRIZ consulting (support of our L1, 2 and 3 consultants)
  - Management Support (does Management support the TRIZ program?)
- Mapping – gather input data
  - Focused brain storming – within this exercise and other
  - Survey – during conference and later of the entire organization's TRIZ population
  - Perception Mapping – business process CEC/9 Screens (TBD)
- Create program profile – organize and understand data
- Program redirection – make program direction decisions
- Implementation – execute any program changes
- Follow-up – did we make the right moves?

# Survey

- Need all TRIZ trained (all levels) employees to complete the survey (33 questions)
- Token of Appreciation for Completed Surveys

## Utilization of TRIZ Survey - Rev 5

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### Instructions: check and annotate as applicable

- a.) If you are trained at the Basic level - 1 (or below) please complete sections **Demographics, General, and Basic Level - 1**
- b.) If you are trained at the Advanced level - 2 please complete sections **Demographics, General, Basic Level - 1, and Advanced Level - 2**
- c.) If you are trained at the Expert level - 3 please complete sections **Demographics, General, Basic Level - 1, Advanced Level - 2, and Expert Level - 3**

Thank you for your time in improving *Org.* utilization of the TRIZ methodology

## Demographics (all TRIZ trainees)

1 What is your highest level of education completed?

*(check one box only)*

High School

Technical/Vocational School

Undergraduate

Graduate

Post Graduate



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# Discuss TRIZ Usage Techniques Currently Employed in the *Organization*

| Consulting Techniques       | Methodology Owner | Problem Owner | "Sales" method        |
|-----------------------------|-------------------|---------------|-----------------------|
| Walk-in consulting hours    | C                 | T, B, c       | advertising           |
| Consultant owns problem     | C                 | C             | self selected         |
| Consultant owns methodology | C                 | T, B          | dept task             |
| TRIZ class consultation     | c                 | c             | mandatory             |
| User Group consulting       | c                 | c             | selective advertising |
| Drive by consulting         | C                 | T, B          | word of mouth sales   |

| Legend                       |
|------------------------------|
| C = TRIZ consultant - Senior |
| c = TRIZ consultant - Junior |
| T = technology expert        |
| B = business process expert  |

# Discuss TRIZ Usage Techniques Currently Employed within the *Organization*

## Technique vs. TRIZ Program Issues

| Methodology Problem Addressed              | Consulting Technique     |                         |                             |                         |                       |                     |
|--|--------------------------|-------------------------|-----------------------------|-------------------------|-----------------------|---------------------|
|  | Walk-in consulting hours | Consultant owns problem | Consultant owns methodology | TRIZ class consultation | User Group consulting | Drive by consulting |
| Tech/Business owners do not know TRIZ      | ✓                        |                         | ✓                           |                         |                       | ✓                   |
| Eroding TRIZ skills                        | ✓                        | ✓                       | ✓                           | ✓                       | ✓                     | ✓                   |
| Need focused brainstorming                 | ✓                        |                         |                             |                         |                       | ✓                   |
| Little problem solving time                | ✓                        |                         |                             | ✓                       |                       | ✓                   |
| Consultant skills not growing enough       |                          | ✓                       | ✓                           |                         |                       |                     |
| Need to expose TRIZ to population          | ✓                        |                         |                             |                         |                       | ✓                   |
| Tech/Business owner does not know TRIZ     | ✓                        |                         | ✓                           |                         |                       | ✓                   |
| Tech/Business knowledge needs transferring | ✓                        |                         | ✓                           |                         |                       | ✓                   |
| TRIZ not know in organization              | ✓                        |                         | ✓                           |                         |                       | ✓                   |

# Focused Brain Storming

Want TRIZ to be ubiquitous and easy yet it takes knowledge and skills to execute

# Focused Brain Storming

| TRIZ Utilization Contradiction Analysis |                             |                |                |               |                   |
|---|-----------------------------|----------------|----------------|---------------|-------------------|
|   |                             | 9              | 22             | 25            | 36                |
|   | <b>Worsening:</b>           | Speed          | Loss of Energy | Loss of Time  | Device Complexity |
|   | <b>Improving:</b>           |                |                |               |                   |
| <b>27</b>                               | Reliability                 | 21, 35, 11, 28 | 10, 11, 35     | 10, 30, 4     | 13, 35, 1         |
| <b>33</b>                               | Ease of Operation           | 18, 13, 34     | 2, 19, 13      | 4, 28, 10, 34 | 32, 26, 12, 17    |
| <b>35</b>                               | Adaptability or Versatility | 35, 10, 14     | 18, 15, 1      | 6, 29         | 15, 29, 37, 28    |
| <b>39</b>                               | Productivity                |                | 28, 10, 29, 35 |               | 12, 17, 28, 24    |

| Principle | Hits | Principle | Hits | Principle | Hits | Principle | Hits |
|-----------|------|-----------|------|-----------|------|-----------|------|
| 35        | 5    | 18        | 2    | 1         | 2    | 21        | 1    |
| 28        | 5    | 17        | 2    | 37        | 1    | 19        | 1    |
| 10        | 5    | 15        | 2    | 32        | 1    | 14        | 1    |
| 29        | 3    | 12        | 2    | 30        | 1    | 6         | 1    |
| 13        | 3    | 11        | 2    | 26        | 1    | 2         | 1    |
| 34        | 2    | 4         | 2    | 24        | 1    |           |      |

# Focused Brain Storming

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| 13        | 3    | 11        | 2    | 26        | 1    | 2         | 1    |
| 34        | 2    | 4         | 2    | 24        | 1    |           |      |

# Focused Brain Storming

## Principle **35**. Parameter Changes

A. *Change an object's physical state (e.g. to a gas, liquid, or solid).*

Virtual prototyping

Numerical simulation

Virtual shopping - e.g. Amazon.com

Telephone banking

Electronic voting in elections

B. *Change the concentration or consistency.*

'Six Thinking Hats' (33)

'Six Action Shoes' (35)

Change the team structure (e.g. football teams use substitutes)

Stores introduce 'special offers' and other promotions

# Focused Brain Storming

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# Focused Brain Storming

Change the team structure (e.g. football teams use substitutes)

Ideation – use temporary TRIZ team that is neither customer department based nor TRIZ department based but rather temporarily (“substitutes”) charged to headcount of customer’s department (IT Flex model)

# Focused Brain Storming

- Open discussion
  - What problem(s) are we trying to solve?
    - Want TRIZ to be ubiquitous and easy yet it takes knowledge and skills to execute
    - Others?
  - “New” solutions

# Comments or Questions?

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# Back-up

- Consulting Techniques Pros and Cons

# Dedicate Consultation Time

- Consultant available during regularly scheduled time slots and at predetermined locations
- Consults to trained and untrained tech owners
- Pros
  - Convenient to “customers”
  - Provides 1:1 learning/sharing
  - Can help with problem solving inertia
  - Great learning for consultants
  - Provides some TRIZ advertising opportunities
  - Supports a wide variety of customers and problem categories
- Cons
  - Wastes a lot of consultants time (slots generally not filled)
  - Better suited to arms length consulting which can slow progress and/or disfavor non-TRIZ trained customers
  - Requires dedicated time from consultants

# TRIZ Consultant Owns Analysis of Specific Issue

- Consultant owns problems
- Utilizes technical experts for support
- Pros:
  - Great Usage of TRIZ methodology
  - Consultant skill levels grows
  - Can work with non-TRIZ tech owners
- Cons:
  - Can take time to absorb technical knowledge necessary to complete exercises (functional model, CEC, etc.)
  - Tech owns can feel like they do not own solution
  - Tech owners do not learn as much about TRIZ as they could

# TRIZ Consultant Assists w/ Analysis of Specific Issue

- Tech experts own problem
- Utilizes TRIZ consultant for methodology support
- Pros:
  - Problem modeling quickly absorbs correct technical detail
  - Tech owners skill levels grows
- Cons:
  - Requires that tech owners have TRIZ skills
  - Can take time to apply TRIZ methodology (i.e., team problem execution during TREIZ training – can be slow and painful)
  - TRIZ consultant does not feel ownership of problem
  - TRIZ consultants do not grow as much in their execution of methodology

# TRIZ Class Consulting

- Tech experts own problem
- Utilizes TRIZ consultant for methodology support
- Pros
  - Dedicated consulting time
  - Provides 1:1 learning/sharing
  - Can help with problem solving inertia
  - Great learning for consultants
  - Tech owners have TRIZ Skills
- Cons:
  - Continued consultation may not be available after the class
  - TRIZ consultant does not feel ownership of problem
  - TRIZ consultants do not grow as much in their execution of methodology

# Individual Tool Consulting

- TESE – worked well with IT Innovation Forum in generating new and improved product ideas
- Contradiction Matrix – generated engineering contradictions based on short consult with Auto group and generated valuable 40 Principals list
- Nine Screens – quick and effective business process analysis with HR

# Users Groups

- Pros
  - Gathering of TRIZ trained folks
  - Could be dedicated work time
- Cons
  - VF users groups – fell away quickly
  - Informal “local” users group – hit and miss
  - Momentum problems likely due to lack of objectives

# Contact Information

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