

# 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 Intel TRIZ Usage Objective
2. Summarize Process Towards Achieving Objective
3. Discuss TRIZ Usage Techniques Currently Employed at Intel
4. Capture Focused Brainstorming While Demonstrating One Technique - Drive by Consulting

# 1. Communicate 2008 Intel TRIZ Usage Objective

- Improve utilization of TRIZ within Intel
  - 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., F11X PEs)
  - 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 Intel 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 Intel's 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

# Discuss TRIZ Usage Techniques Currently Employed at Intel

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 at Intel

## 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

TRIZ Utilization Contradiction Analysis		9	22	25	36
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<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

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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

## 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 TRIZ 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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