

TOP-TRIZ: Theory and Practice

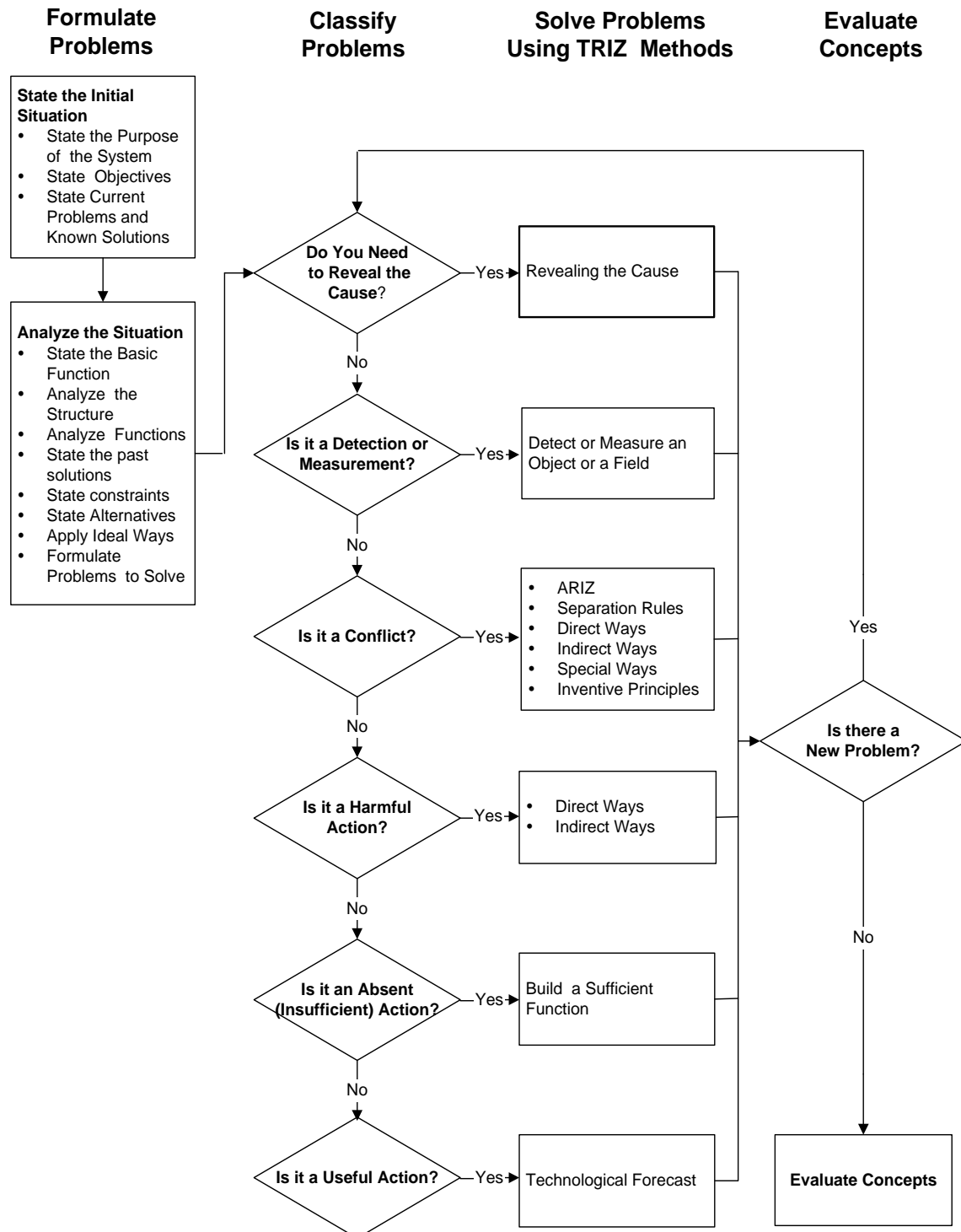
Topics covered:

- Analysis of a Situation and Problem Formulation
- Ideal Ways (the best directions to design the ideal product or process)
- Solving a class of problems called an *Insufficient Function*
- Solving a class of problems called a *Conflict*
- Solving a class of problems called a *Harmful or Unwanted Function*
- Solving a class of problems called *Measurement*
- Solving a class of problems *Revealing the Causes of a Failure*
- Accelerated development of the new generation of products and processes by applying *Technological Forecast*
- Combined application of TRIZ Methods
- Solving participants' real-life problems
- Implementation of TRIZ

Textbooks

Royzen, Zinovy. *Designing and Manufacturing Better Products Faster Using TRIZ*. TRIZ Consulting, Inc., Seattle, 2008.

TOP-TRIZ Flow Chart



Outline:

- **Problem Formulation**
 - Initial situation
 - A system, its structure, super system and environment
 - Tool-Object-Product (TOP) Function Modeling
 - Function diagram of a system
 - Problem formulation
 - Problems that are worth solving
 - Case studies

- **Ideal Ways (the best directions to design the ideal product)**
 - Ideal Way 1. Eliminate the function of an item involved in a problem.
 - Ideal Way 2. Substitute an item involved in a problem
 - Ideal Way 3. Make an item itself eliminate its disadvantage
 - Problem formulation
 - Utilization of the resources of a system, supersystem and environment
 - Case studies

- **Development of the new generation of products and processes by solving a class of problems called *an Insufficient Function***
 - Tool-Object-Product (TOP) model of an insufficient function
 - Techniques to Build models of the simplest sufficient functions
 - Case studies

- **Development of the new generation of products and processes by solving a class of problems called *a Conflict***
 - Tool-Object-Product (TOP) Models of conflicts
 - TRIZ Conflict Solving Methods

- **Algorithm for Conflict Solving**
 - Step 1. Formulation of the versions of the conflict
 - Step 2. Formulation of the extreme versions of the conflict
 - Step 3. Building the model of the problem to solve
 - Step 4. Formulation of the Physical Contradiction and the Ideal Final Result
 - Step 5. Physical Contradiction Separation.
 - Step 6. Utilization of the resources.
 - Step 7. What to do if the problem has not been solved
 - Case studies

- **Five techniques for Physical Contradiction Separation**
 - Case studies

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- **Special Ways to introduce new resources without causing subsequent problems**
 - Case studies
- **Development of the new generation of products and processes by solving a class of problems called *a Harmful or Unwanted Function***
 - Tool-Object-Product (TOP) Model of a harmful or unwanted function
 - Six techniques for direct elimination of a harmful or unwanted action
 - Techniques for indirect elimination of a harmful or unwanted action
 - Three techniques for elimination of the consequences of a harmful action
 - Techniques to turn a harmful action into a useful action
 - Case studies
- **Development of the new generation of products and processes by solving a class of problems called *Measurement Function***
 - Techniques for elimination the need for measurement
 - Techniques for building the simplest models of a sufficient measurement function
 - Techiques for selection the best object for measurement or detection
 - Case studies
- **Development of the new generation of products and processes by solving a class of problems called *Revealing the Cause of a Failure***
 - TRIZ technique for revealing the causes of a failure
 - TRIZ technique for the causes of the potential failures
 - Combined application of TRIZ Methods
 - Case studies
- **Accelerated development of the new generation of products and processes by applying *Technological Forecast***
 - Technological forecast using trends of the evolution of the successful products
 - Avoiding common mistakes in technological forecast
 - Combined application of TRIZ Methods
 - Case studies
- **Concept Evaluation**
- **Combined application of TRIZ Methods**
- **Applying TRIZ to Problems Brought by the Participants**
- **Group Discussion**

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INSTRUCTOR:



Zinovy Royzen is a Master of TRIZ certified by Genrich Altshuller, the creator of TRIZ. He is the founder and President of TRIZ Consulting, Inc., Seattle, Washington, the first U.S. company to apply TRIZ, cofounder and 10- year Director and Vice President of Altshuller Institute for TRIZ Studies and affiliate associate professor of

University of Washington, Seattle.

Royzen Zinovy has been applying TRIZ to new product development, quality improvement, cost reduction, and inventive problem solving in innovation since 1980. He has been developing and teaching contemporary TRIZ since 1984.

He has led workshops and/or provided consultation at numerous organizations, including Boeing Co., Eastman Kodak, Ford Motor Company, Hewlett-Packard, Illinois Tool Works, Kimberly-Clark, Lexmark International Inc., LG Electronics, Lucent Technologies Inc., NASA, Paccar, Plug Power, Philips Semiconductors, Samsung, Siemens, Thiokol Corporation, Western Digital Corporation, Weyerhaeuser Company, and Xerox.

Mr. Royzen has been conducting his Basic, Advanced Practice and Certified TRIZ Practitioner courses for UCLA Extension since 1997.

His customized on-site workshops provided his clients with high quality invention proposals and significant saving.

He has taught more than 600 engineers at The Boeing Co. alone. The Boeing Co. credited his TRIZ training and TRIZ solutions developed in class to 767 Tanker Transport Project as critical in winning 8 orders worth \$1,500 million from the governments of Italy and Japan. He is a MS in mechanical engineering, the author of many TRIZ papers and holds 27 patents.