Ideation TRIZ-based System for Enriching and Strengthening Intellectual Property

Introduction
Presentation Content

- Introduction
- Ideation International Inc. - company and its activities
- Potential Benefits to Patent Attorneys
- TRIZ and I-TRIZ Overview
- Ideation Software-Based Analysis and Case Studies
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Ideation International Overview

- Established in November of 1992 as a Delaware corporation
- Provider of TRIZ-based services and products
- Acquired leading TRIZ School in Russia (The Kishinev School)
- Headquartered in Farmington Hills, MI
- Includes world’s largest group of TRIZ masters and certified TRIZ specialists
- Conducted business with over 5000 enterprises worldwide
- Active in 40 countries and 60 universities
- Has trained over 250,000 individuals worldwide
- Conducts continuous research/advancement of TRIZ methodology
Ideation Office of Innovation

Based on Ideation TRIZ (I-TRIZ) methodology

Inventive Problem Solving (IPS)
A systematic procedure for resolving tough technological problems, enhancing system parameters, improving quality, reducing cost, etc. for current generations of products and technologies.

Anticipatory Failure Determination (AFD)
A systematic procedure for identifying the root causes of a failure or other undesired phenomenon in a system, and for making corrections in a timely manner.

Directed Evolution® (DE)
A systematic procedure for strategically evolving future generations of technological systems.

Control of Intellectual Property
A systematic procedure for increasing IP value and providing protection from infringement and circumvention.

Failure Analysis
Failure Prediction
## What does Ideation offer?

<table>
<thead>
<tr>
<th>I-TRIZ Application/process</th>
<th>Education</th>
<th>Software</th>
<th>Publications</th>
<th>Analytical Services</th>
<th>Age of Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventive Problem Solving</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>60 yrs</td>
</tr>
<tr>
<td>Failure Analysis</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>30 yrs</td>
</tr>
<tr>
<td>Failure Prediction</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>★</td>
<td>30 yrs</td>
</tr>
<tr>
<td>Directed Evolution</td>
<td>★</td>
<td>Internal use</td>
<td>★</td>
<td>★</td>
<td>20 yrs</td>
</tr>
<tr>
<td>Enhancement of Intellectual Property</td>
<td>★</td>
<td>Internal use</td>
<td>★</td>
<td>★</td>
<td>8 yrs</td>
</tr>
</tbody>
</table>

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Projects Completed by Ideation
Potential Benefits to Patent Attorneys

- Evaluation of submitted invention disclosures via a software supported process, allowing to:
  - Expand original disclosures into additional patent applications
  - Strengthen client’s technology and patent protection
- Improved pre-application-draft communication with clients via invention mapping with Ideation IP software
- Assistance with claim drafting, i.e., formulation of claim scope and structure
- Assistance with infringement analysis/design around/litigation support
- Expanding the client base via Ideation’s network of overseas partners and US contacts (universities, foreign patent attorneys, enterprises, management consultants, etc.)
Over 65 Years of Development initiated and led by G. Altshuller and involving hundreds of scientists and inventors

More than 2,000,000 worldwide patents

Practical experience of thousands of scientists, inventors, engineers, managers, businessmen, etc.

Feedback from solving with TRIZ thousands of problems

History of evolution in different areas of technology and science, social systems, business, management, art, languages, etc.

Theory of Inventive Problem Solving

TRIZ
Patterns of Evolution: The Primary TRIZ Postulate

- Systems evolve not randomly, but according to objective patterns
- Patterns can be identified based on the analysis of historical development of technology, markets and social trends
- Identified patterns can be purposefully used for system development, avoiding numerous blind trials

Patterns of Evolution: Common threads between evolving systems.
Increasing system dynamism allows functions to be performed with greater flexibility or diversity.

Line of evolution: Increasing degree of freedom

Over 500 lines have been identified for technology, business, marketing, etc.
Patterns of Evolution

1. Stages of Evolution
2. Evolution toward Increased Ideality
3. Non-Uniform Development of System Elements
4. Evolution toward Increased Dynamism and Controllability
5. Increased Complexity, followed by Simplification
6. Evolution with Matching and Mismatching Elements
7. Evolution toward Micro-level and Increased Use of Fields
8. Evolution toward Decreased Human Involvement
Evolutionary Approach versus Traditional Trial & Error Method

Evolutionary Approach: Majority of trials are productive because they follow defined Patterns of Evolution.

Trial & Error:
Traditionally, majority of trials fail because they are influenced by psychological inertia.
TRIZ Differentiation

- TRIZ is the only innovation methodology that is:
  - Innovation knowledge based – System of Operators
    - Collected
    - Refined
    - Structured
    - Ready to use
  - Evolutionary directed
    - Narrowing down solution space by following patterns of evolution
    - Searching for solutions in right directions and places
- I-TRIZ also incorporates all other techniques utilized in appropriate processes and tools
Directed Evolution®

- A systematic process to predict the future generations of a system by inventing them, and
- A systematic approach targeting the identification of a comprehensive set of potential evolutionary scenarios for:
  - Products/Services/Processes
  - Technologies
  - Organizational structures
  - Industries
  - Markets
Evaluation and Enhancement of Intellectual Property

- Disclosure Inspection
- Invention Evaluation
- New Inventions
- New Business
- Directed Evolution®
- Avoid Infringement
- Circumvent Competition
- Patent Deconstruction®
- Validate Inventions
- Better Patents
- Increasing
- IP value
- Using
- I-TRIZ
- Invention
- Analysis
- Reveal Strengths / Weaknesses
- Broader / Most Comprehensive Claims
Directed Evolution provides Technology Road Map

Inventor

Research

Inventions

Disclosures

Decisions (1-3 month)

Rejected Disclosure

Unused Patents

Investment

No Investment

Patent prosecution (2 years)

Find New Applications

License

Commer

ialize

Further IP Developed

Improvements via Patent Analysis

Rejected Disclosure Improvement

Enhanced IP Process

File? Yes

No

Closed case

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Case Study -- US5644431 Directional image transmission sheet and method of making same
15.2. Consider resources to provide the useful factor (multiplicity of convex lenses).

16. Find an alternative way to obtain (multiplicity of convex lenses) that offers the following: provides (each of convex lenses), does not require (substantial area covering by lenses).

16.1. Improve the useful factor (multiplicity of convex lenses).

16.2. Increase effectiveness of the useful action of (multiplicity of convex lenses).

16.3. Apply universal Operators to provide the useful factor (multiplicity of convex lenses).

16.4. Synthesize the new system to provide (multiplicity of convex lenses).

17. Find a way to exclude (predetermined index of refraction) without deterioration of the system functioning.

17.1. Obtain the useful result without the use of (predetermined index of refraction).

17.2. Consider resources to provide the useful factor (predetermined index of refraction).

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**Increase effectiveness**

*(insufficient useful function)*

To increase the efficiency of a useful function, consider the following recommendations (Operators):

- Intensify a field
- Apply multiple actions
- Introduce a field-intensifier
- Concentrate energy
- Introduce an additional field
- Substitute a field with a more effective one
- "Make a road"
- Transform the environment

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**Recommendations for idea generation are automatically generated by software for each problem statement**
Exposing Specific Claim Weaknesses

Enabling the possibility of designing around the patent or improving claim scope by exposing claim weaknesses through either excluding or making material changes to the crossed-out elements.
Using Evolution Patterns to Compare a Particular Invention to Prior Art

- Evolution of useful functions
- Elimination of harmful functions
- Evolution of applications
- Integration/structuring
- Increasing of dynamism and controllability
- Evolution with matching/mismatching
- Evolution of resources application
- Evolution of contradictions
- Increasing complexity followed by simplification
- Evolution towards multi-level
- Changes in human involvement

Prior Art (one layer of lenses)
Invention (two layers of lenses)
Using Evolution Patterns for Predicting Subsequent Steps of Evolution

Prior Art (one layer of lenses)
Invention (two layers of lenses)
Direction for future evolution of the system
Business Results of the Project

- The work produced 17 new ideas addressing specific interests/concerns, in particular:
  - An image that transforms continuously in response to small shifts in viewing angle, producing a calming effect of a dynamic, fluidly changing view

- Opened up new applications and markets, for example:
  - Interior and exterior home furnishings (wallpaper, decorations)
  - Innovative fashion designs
  - Interior and exterior features in transportation
Patent Fence For Chemical Formulation

Original Patent
Protected Resources

Component 1

51 claims of original patent

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Additional Intellectual Capital

Evolutionary Resources Resulted from DE Application

Component 2
Chemistry
Component 1
Chemistry
Process
Chemistry
Phase

1. Heterogeneous product

136. Homogenized Heterogeneous product
51 claims of original patent

1. Heterogeneous product

Directed Evolution Results
151 target areas to start new application of original patent ideas

Component 2

Chemistry

Other

Chemistry

Component 1

Process

Chemistry

Phase
Conclusion

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Questions and Answers
Thank you!

Ideation team