Methods and Tools for Successful Management of Innovation Processes

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Statement to Challenge:

Innovations are hard to predict. You can assign a certain number of expert hours to a project, but you can’t guarantee that any specific level of innovation will happen.
Business Aspects of Innovations:

- Rare unpredictable event with potentially important economic benefits
- Costs already consumed
- Scalability - revenue's order of magnitude
- Easy to store
- Added value over extended time period
- Enabling patent protection
- Temporary competitive advantage
- Possible spill-over effects
Patents are Limiting Freedom to Operate

- A patent is a **monopoly** granted by a state to an inventor or his/her assignee for a limited period of time.
- Invention must be new, inventive (nontrivial) and useful or industrially applicable.
- The monopoly granted to a patentee is the **right to prevent others** from making, using, selling, or distributing the patented invention without permission.
How to Improve Innovation Process?

- Increase Investments
- Better Access to Relevant Knowledge
- Improve Creative Problem Solving

1. Problem Analysis
2. Creating Associations from Relevant Knowledge
3. Synthesis and Creation of Innovative Solutions
Economic Success of Innovations

3,000 (5,000) raw ideas

100 initial projects

10 finished projects

2 new products on the market

1 successful product
Pareto principles - Nonlinear distributions

80% of the effects come from 20% of the causes

- 80% of profits come from 20% of customers
- 80% of complaints come from 20% of customers
- 80% of profits come from 20% of the time you spend
- 80% of sales come from 20% of products
- 80% of books sold come from 20% of writers
- 80% of wealth is in hands of 20% of population
- 80% of academic citations come from 20% of authors
- 80% of revenues from innovations come from 20% of them
98% of inventions are based on already known solutions.
TRIZ - Theory of Inventive Problem Solving

Scientists, engineers and designers frequently face situations that qualify as contradictions, where improving one thing degrades another, or where requirements seem to ask you to go in two directions at the same time.

Contradictions are frequently resolved through compromises, causing people to concede that they will not get the optimal situation they hoped for.

TRIZ can help you to find an optimal solution, without compromises.
TRIZ is Enabling Change of View

- Typical problem (contradiction)
- Specific problem
- Matrix of inventive principles
- Generalization of the problem
- Elimination of key contradiction
- Concretization of solution
- Typical solution
- Specific solution

Semantic TRIZ
What are this Companies doing differently?

<table>
<thead>
<tr>
<th>Aerospace &amp; Defense</th>
<th>Pratt &amp; Whitney</th>
<th>Boeing</th>
<th>Honeywell</th>
<th>Northrop Grumman</th>
<th>Airbus</th>
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<tr>
<td>Automotive</td>
<td>MAHLE</td>
<td>Bosch</td>
<td>Bentley</td>
<td>Cummins</td>
<td>Delphi</td>
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<td>Immucor Gamma</td>
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<td>LG</td>
<td>Christie</td>
<td>FEI</td>
<td>Samsung</td>
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</tbody>
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Why Companies are Using Goldfire

- Unable to leverage Internal knowledge
- Poor visibility into global content

- Reinvention and redundant activity
- Lessons-learned & tribal wisdom not readily captured & reused
- Can’t leverage or apply ideas from other industries

- Problem & opportunity analysis incomplete
- Pace of innovation too slow

- Lack of timely, relevant insights
- Treat symptoms, repeat past errors, overlook known facts
- Idea generation not consistent
- Assumptions & past experience block creative thinking
How Goldfire Can Help

1. Access Relevant Content from Almost Any Source
   - Inside or Outside your Organization:
     - ECM systems
     - PLM repositories
     - Email
     - Intranets
     - Network Drives
     - World Wide Web
     - Goldfire Intelligence

2. Transform it into Actionable Engineering Intelligence
   - Goldfire’s Patented Technology:
     - Reads and understands every document, transforming it into meaningful engineering intelligence.

3. Knowledge Enable Critical Engineering Activities
   - Understands and Supports:
     - R&D
     - Product development
     - Product improvement
     - Technology analysis
     - QA
     - Problem solving
     - Patent research

4. Reduce Costs / Increase Revenues
   - Benefits:
     - Faster time to market
     - Reduced costs
     - Better solutions
     - New markets
     - Knowledge reuse

Innovation requires information...
Access Relevant Content

- **Internal sources of value**
  - Private or shared folders; > 100 document types
  - Email, corporate repositories, PLM repositories

- **External content you value**
  - Competitor websites
  - Supplier websites
  - Customer websites

- **Goldfire Intelligence**
  - External content of high value to engineers & scientists
  - Global patent literature
  - Deep Web sites
  - Innovation Libraries
“Yet these contaminants can falsely trigger the sensor if they build up on the included emitter or receiver. To prevent such false triggering manufacturers incorporate an alarm output into the sensor circuitry.”

Goldfire Semantic Technology

Goldfire extracts underlying meaning, so you get back precisely relevant answers

Subject: Manufacturers
Action: incorporate
Object: alarm

Whole: sensor
Consists of: includes
Parts: receiver

Cause: contaminants
Produces: trigger
Effects: sensor
Reduce Costs / Increase Revenues

- Reduced research time
- Elimination of redundant work
- Better problem & opportunity analysis

- Faster time to market
- Reduced Costs
- Better solutions
- New Markets
- Knowledge Re-use
Where can Goldfire help you?

Users Include:

- Engineers
- Researchers
- Scientists

- Quality & Reliability
- Marketing
- Business Development

Market Analysis
New Product Development
Product Improvement
Leverage IP

Users Include:
Research, Development & Design - Examples

Product Development Scenario:
Our customers are reporting that our gate opening device sometimes opens the gate when there is no vehicle present.

Use Case Examples:
1) Analyze a topic
2) Research a question
3) Brainstorm a Problem
4) Investigate a technology
Type in a specific query

Result set classified for subsequent drill-down by Type of Answer, & by Topic

Link opens document & positions on the highlighted Relevant Sentence

Ranked answers are returned, not just a list of documents

Document summaries automatically created

Select Knowledge Sources
Libraries to stimulate creative ideas

Knowledge sources automatically searched to find potential solutions

Subsystem to rank potential solutions
Who is working with technologies to automatically detect and classify a moving vehicle? And what are they doing?

Understand what is happening with a technology, and who is doing it.

View activity trend-lines, or lists of companies, inventors & patents.

Save Solution
View inventors list for this company
View patent list for this company
Go to company profile
Review a summary

Review forward or backward references
Invention Machine

- A leading innovation software provider with hundreds of customers in more than 25 countries.
- Based in Boston, with offices in six countries and a global network of distributors and partners.
Questions & Answers

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Questions?