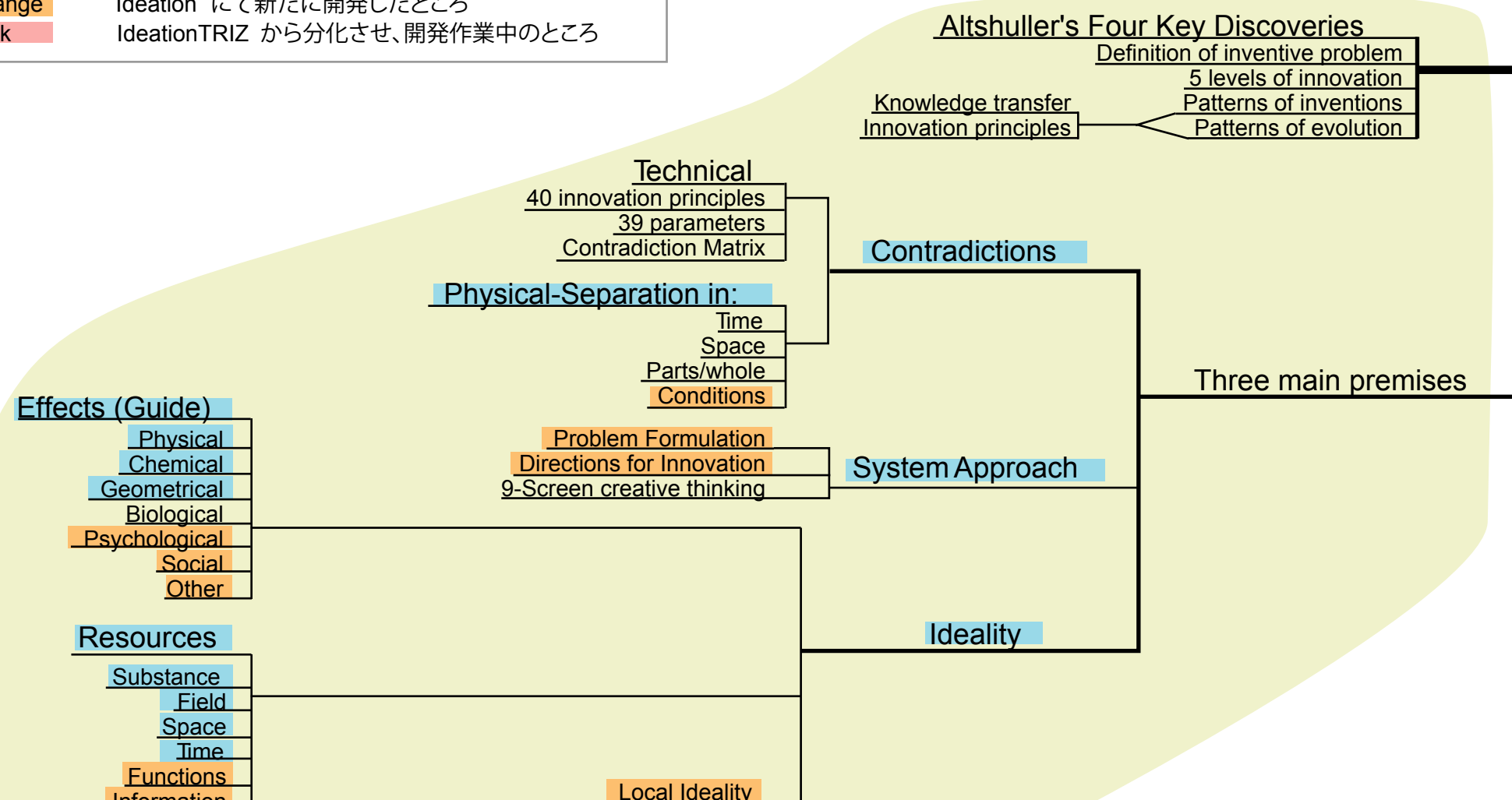


IdeationTRIZ Map

Color Code

- Plain 古典的TRIZと同様の内容
- Blue Ideation にて古典的 TRIZを改良・変更したところ
- Orange Ideation にて新たに開発したところ
- Pink IdeationTRIZ から分化させ、開発作業中のところ

Theory



IdeationTRIZ

Applications

Applications

Inventive Problem Solving (IPS)
Anticipatory Failure Determination
Directed Evolution
TRIZ for R&D
Scientific Problem Solving
Business and organizational development
TRIZ Value Engineering
Idealization (TRIZ cost reduction)
Intellectual property validation and enhancement
Product / process improvement
Children education

Inventive Problem Solving With IWB

Identify and document the problem (Complete ISQ)

Problem Formulation

Building the graphical description (diagram)
Formulate Directions

Prioritize Directions

Develop Concepts

Generate ideas with System of Operators
Combine Ideas into concepts

Evaluate results

Identify and solve secondary problems
Predict and eliminate potential failure - use abbreviated IFP

Inventive Problem Solving

Describe the system

System name
System structure
System functioning
System environment

Describe the problem

Problem name
Mechanism causing the problem - Use abbreviated IFA
Undesired consequences of the problem
Problem history: previous attempts to solve
Other systems with similar problems
Alternatives

Ideal vision

Available resources
Allowable changes (limitations)
Criteria for solution acceptance
Project data and business environment

Abbreviated IFA

1. Invert the problem
2. Amplify inverted problem
3. Search for solutions
4. Formulate hypotheses and tasks for their verification
5. Correct the failure

Abbreviated IFP

1. Invert the problem
2. Create Ideal Scenarios
3. Generate Failure Scenarios
4. Prevent the failures

Processes

Ideation Failure Analysis with IFA software

Complete Failure Analysis Questionnaire

Describe the system
Describe the problem

Failure Analysis modeling

Building the diagram
Formulate hypotheses

Identify history
Localize the problem
Amplify the problem

Verify hypotheses

Categorize
Verify

Correct failures

Apply Operators
Develop Concepts

Evaluate results

Ideation Failure Prediction with IFP software

Complete Failure Prediction Questionnaire

Describe the system
Document known drawbacks
Identify history of the system

Failure Prediction modeling

Building the diagram
Formulate hypotheses
Generate failure scenarios
Apply check lists and Operators

Verify hypotheses

Categorize
Verify

Prevent failures

Apply Operators
Develop Concepts

Evaluate results

Directed Evolution

Analyze the system environment

Identify super-systems for the system
Identify the system market
Identify impeding forces and limitations
Identify driving forces of evolution
Identify contradictory requirements

Analyze the system functioning

Identify useful functions
Identify harmful factors
Identify functional contradictions

Problem Formulation

Build the diagram
Directions from functional analysis
Selected Directions

Assess system resources

Analyze analogous systems

Analyze history of the system evolution

System prototypes
Conditions of the system creation
History of problems

Develop Concepts

List and categorize preliminary ideas
Combine ideas into Concepts

Evaluate results

Meet criteria for evaluating Concepts
Develop workable system
Reveal potential problems
Work with secondary problems
Consider further system development
Plan the implementation

Monitor the system evolution

Monitor changes to the environment
Continuous system improvement
Accumulate new ideas
Prepare to the next step

Tools

Inventive Fields

Mechanical
Thermal
Chemical
Electrical
Magnetic
Radiation
Combinations

Analytical:
Define and model problem situation
Innovation Situation Questionnaire (ISQ)
Problem formulation
ARIZ
Substance Field analysis

Software: TRIZSoft®
Basic I-TRIZ e-learning
Ideation Brainstorming
Innovation Workbench System (IWB)
Ideation Failure Analysis (IFA)
Ideation Failure Prediction (IFP)
Knowledge Wizard (KW)

Knowledge based:
best practices for generating ideas
Patterns / lines
System of Operators

40 innovation principles
Separation principles
76 Standard Solutions
Effects
Selected innovation examples

12 basic patterns
Over 400 lines
Numerous trends

Over 440 Operators
Documented associated chains
About 10,000 Interconnections

Universal Operators

Partial / Excessive action
Inversion
Separation
Segmentation
Integration

General Operators

Synthesize a new system
Increase effectiveness of the system
Eliminate harmful or undesired actions

Specialized Operators

Auxiliary Operators

Smart introduction of substances
Smart introduction of fields
Utilization of resources
Excluding auxiliary functions

Improve useful characteristics

Reliability
Action speed
Mechanical strength
Composition stability
Convenience
Productivity
Manufacturing accuracy
Dispensing accuracy
Shape
Universality
Controllability
Adaptability
Selective mode

Reduced undesired factors

Weight
Overall dimensions
Energy consumption
Complexity
Energy waste
Time waste
Cost
Noise
Deformation, destruction
Wear
Contamination
Overheating
Undesired adhesion
Fire, explosion
Environmental influence
Harmful human actions

Improve measurement/control

Bypass the problem
Direct control
Indirect control

Development

Summary of ongoing development

Complete innovation solution system for R&D
Integration with other business, quality and knowledge management systems like Six Sigma, Stage Gate, etc.
Applying TRIZ to organizational development
I-TRIZ for scientific problem solving (SPS)
Building specialized knowledge bases (chemical, health care, business / management, etc.)
DE and SPS software development
New, more powerful and user friendly software shell
New ideas integrator module
Teaching I-TRIZ in schools and universities
E-learning (Basic TRIZ, IWB master, AFD master)

I-TRIZ differentiations
Integration with other techniques
Focusing on refined innovation knowledge
A unified and integrated knowledge base for all types of problem targeting exhaustive set of potential solutions
New applications developed
Processes developed for each application
TRIZSoft support for most of applications' processes
New analytical and knowledge base tools developed
TRIZSoft® customization
Education
Software
Project based workshop
Coaching / facilitation
Continuous research and advancement
Integrated business model
A turn key solution for TRIZ institutionalization