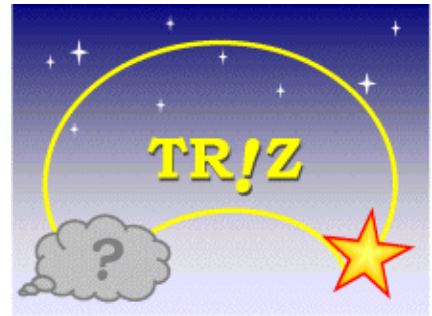


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General Methodology for Creative Problem Solving and Task Achieving (CrePS) — Its Vision —

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Contents:

Methods of creative problem solving

- **Reflection of the present situations**

 - A large variety of methods, including TRIZ

 - Lack of a framework to integrate

- **Our new target at a higher level**

 - A general methodology for filling people's demands

- **General methodology of creative problem solving (CrePS)**

 - Six-Box Scheme as the framework

 - Outlines of CrePS

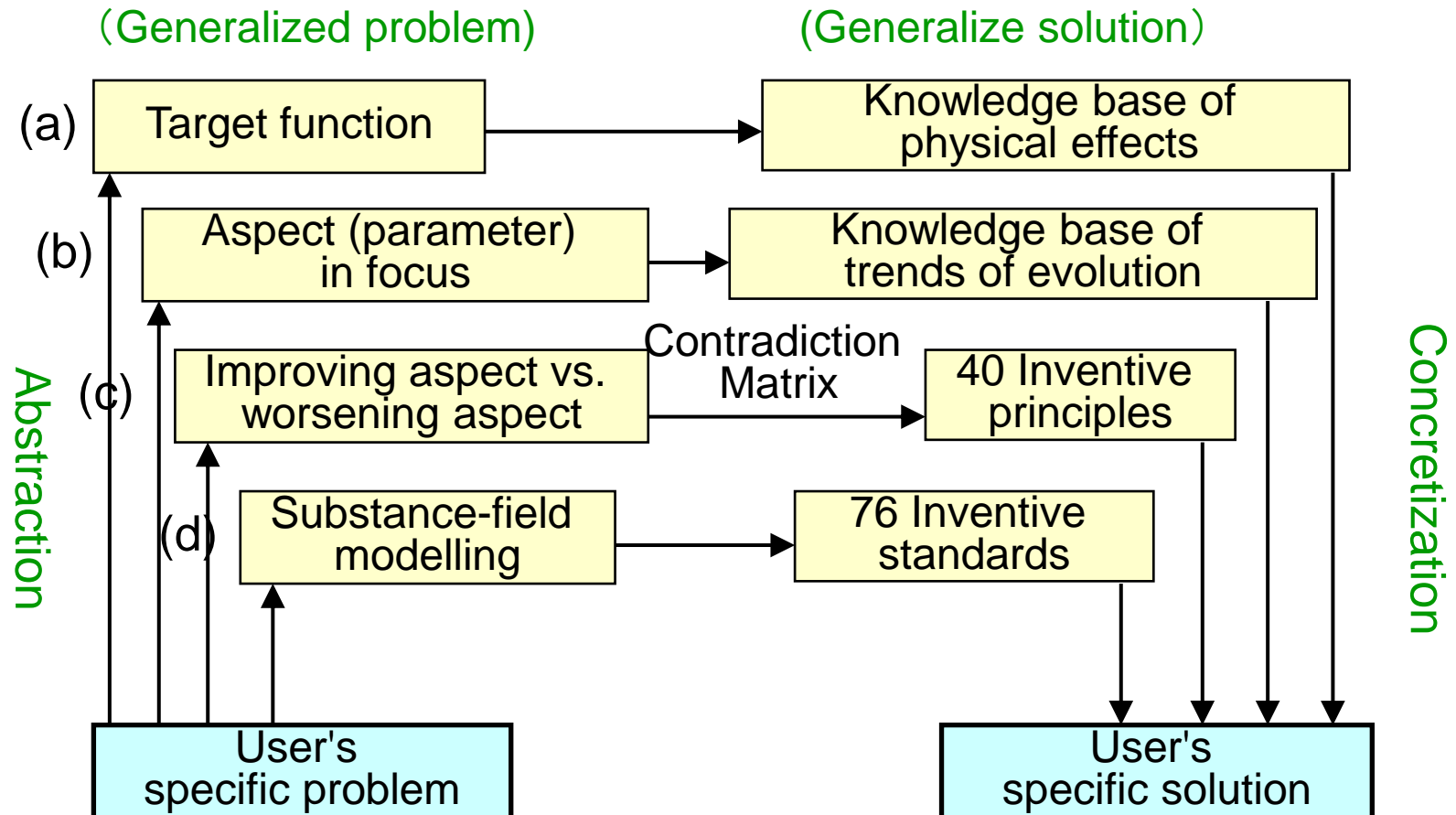
Various methods for creative problem solving & task achieving

Approaches	Examples in conventional methods	Examples in TRIZ/USIT
Basics in Science & Technology	Principles, theories & models in each discipline; knowledge bases	Knowledge bases of physical effects
Learning from cases	Analogical thinking, Collections of hints, Equivalent transformation thinking	Active use of patent databases
Analyzing problems/ tasks	Mind mapping, KJ method (Affinity method), Quality function deployment (QFD), QC tools, Root cause analysis, Value engineering (VE), Functional analysis	Problem definition, Root cause analysis, Function & attribute analysis, Formulating contradictions, Substance-field modeling
Supporting idea generation	Brain storming, Brain writing, SCAMPER	40 Inventive Principles, 76 Inventive standards, Contradiction matrix, USIT operators
Taking care of environment and mental aspects	Brain storming, Facilitation methods, Cynectics, NM method, 'The 3rd alternatives'	Size-Time-Cost (STC) operators, Smart little people (SLP) modeling, Particles method
Realizing the ideas	Design methods in each discipline, Pugh's method, CAD/CAE, Taguchi method	Technical knowledge bases
Foreseeing the future	Using various statistics, Delphi method, Scenario writing	9 Windows method, Trends of technical evolution, S-curve analysis, DE (Directed evolution)
Towards a general methodology	Four -box scheme of abstraction, analogical thinking, ET thinking	Four-box scheme, ARIZ, Six-box scheme of USIT



TRIZ has contributed much to creative problem solving:

Many tools and huge knowledge bases applicable across technical fields

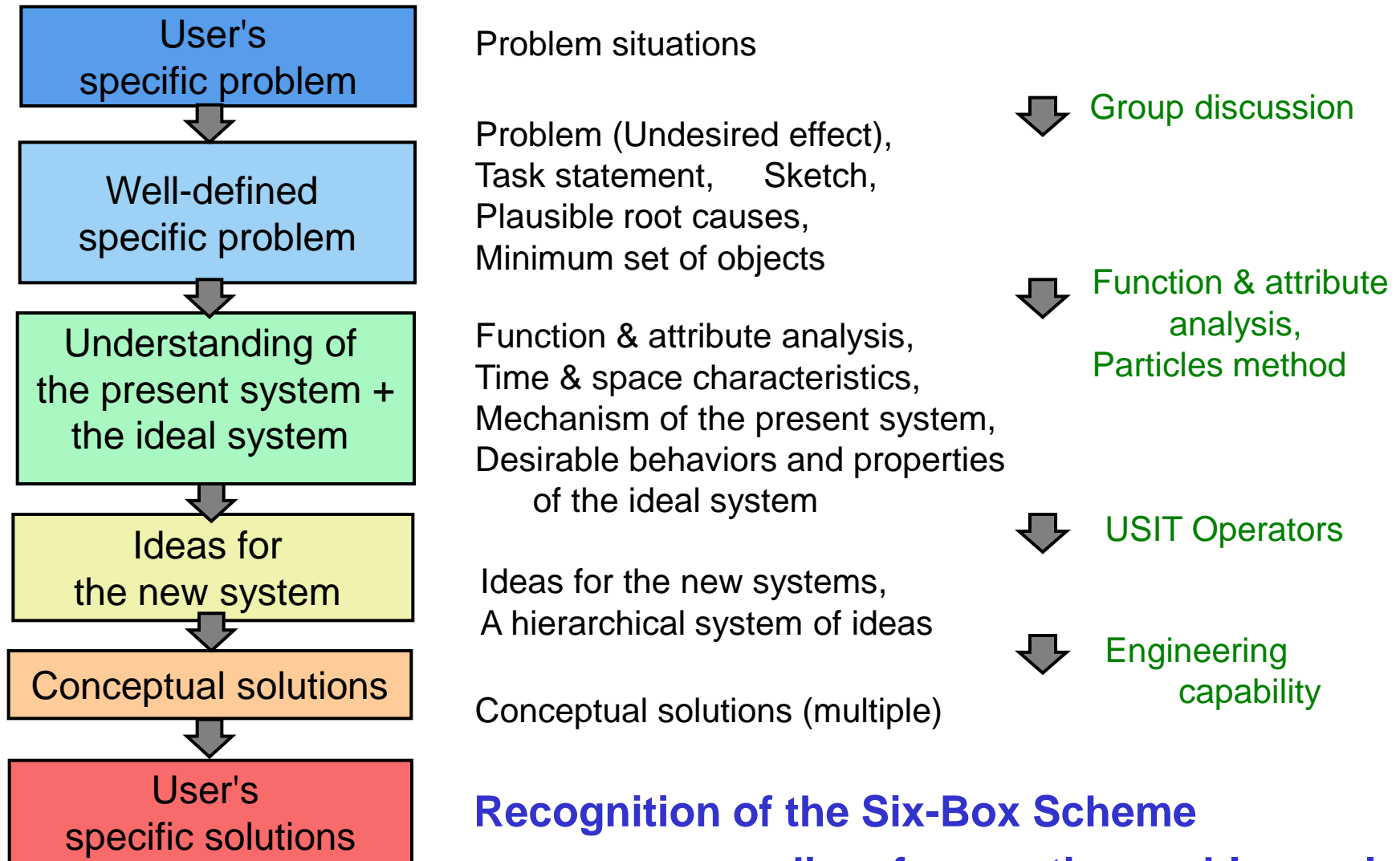


Parallel structure of multiple tools based on the Four-Box Scheme

==> Partialness in each method ==> Complex in the whole process

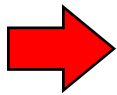
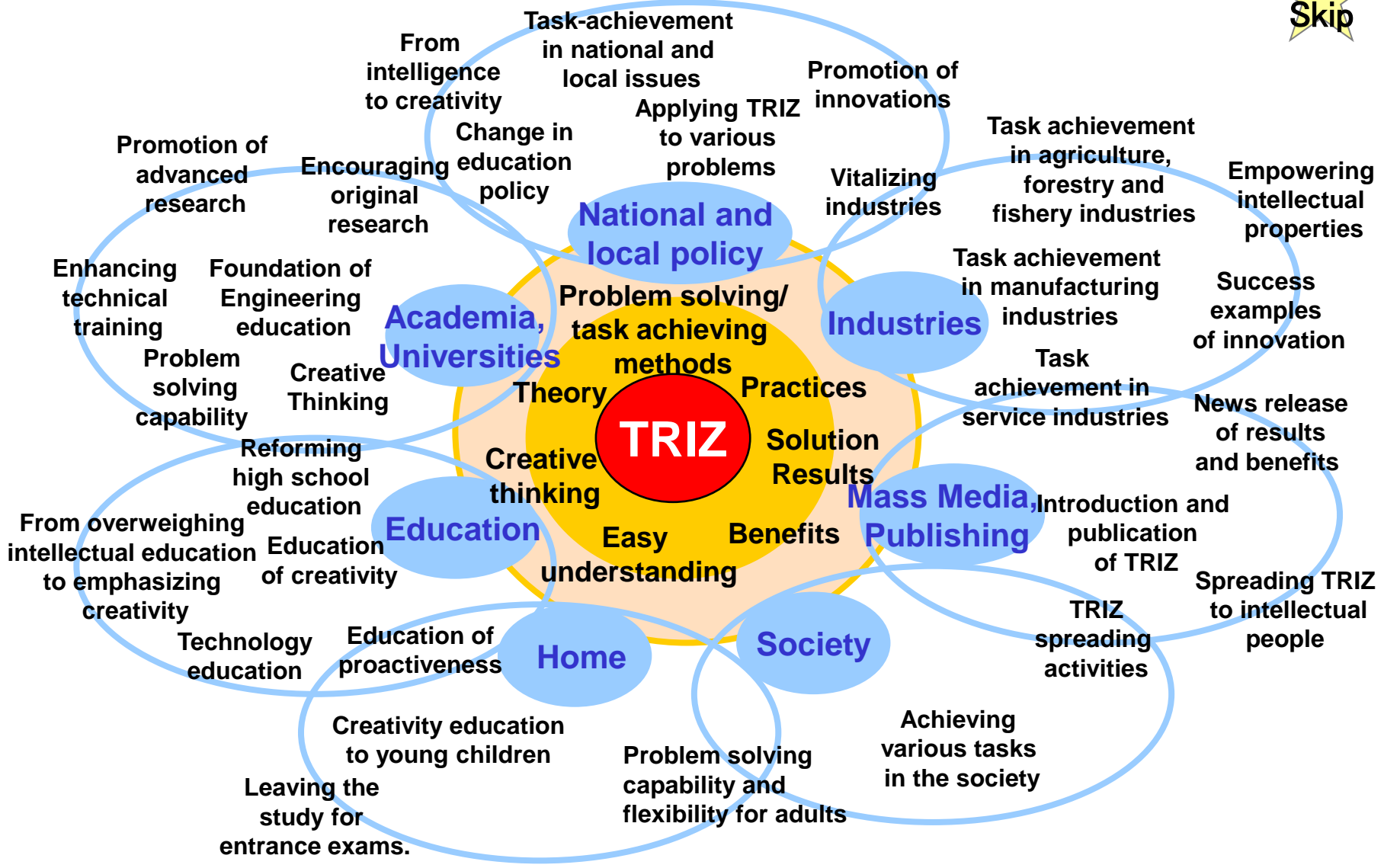
USIT (Unified Structured Inventive Thinking):

An approach to make TRIZ streamlined and easier to learn and use:



**Recognition of the Six-Box Scheme
as a new paradigm for creative problem solving**

Expected Areas of Applying TRIZ



We put TRIZ in the center. But we need a more general method !

Reflection of the present situations around us and TRIZ

(1) Problem solving & task achieving is a job people want to do everywhere.

(2) A huge variety of studies and methods exist for helping the jobs, but they are short in filling the demands. Why?

Because: Being fragmental without a good general framework.

(3) TRIZ has contributed good thoughts and many tools applicable widely, but it is not easy to learn and use by people. Why?

Because: Being specific and complex without a good framework.

(4) We have two directions:

- Customize TRIZ well for the (narrow range of) target persons.

- Generalize TRIZ well for the (wider range of) target persons

==> General methodology of creative problem solving. (CrePS)

(5) General methodology CrePS should be a super-system of TRIZ integrating various existing methods. How possible?

==> With the Six-Box Scheme as the new framework/paradigm.

Our new target at a higher level

guided by the reflection of the present situations

a new target at a higher level.

**To establish a general methodology of
creative problem-solving / task-achieving,**

to spread it widely, and

to apply it

**to problem-solving and task-achieving jobs
in various domains**

in the whole country (and the world).

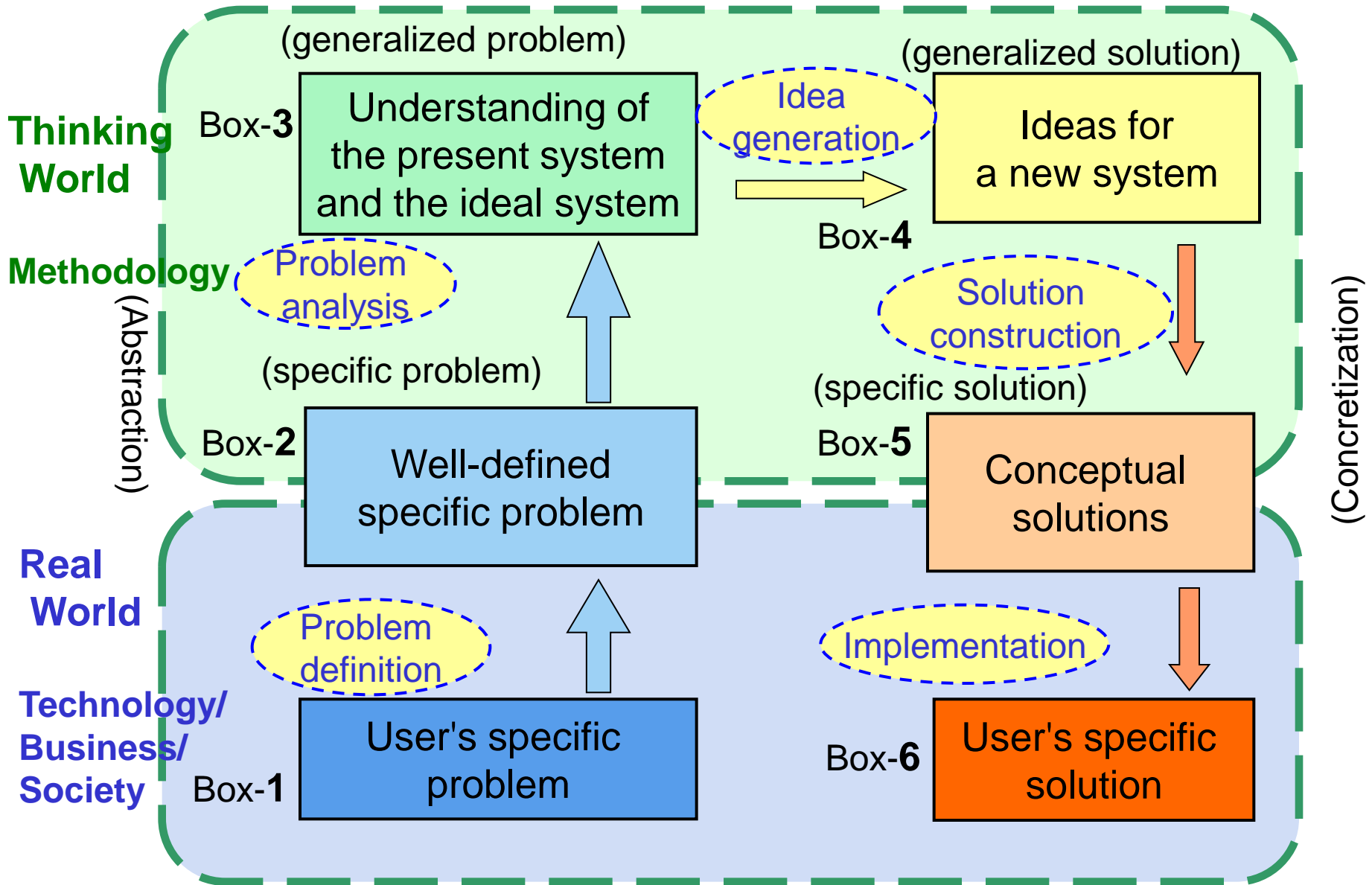
Clarifying the Target of Our New Methodology



"A General Methodology for Creative Problem Solving & Task Achieving" (CrePS)

- Help to solve problems (i.e., undesirables) and to achieve tasks (i.e., desirables).
- Capable to guide to new creative solutions and measures even for the problems/tasks conventionally thought difficult/impossible.
- Applicable generally and universally to different fields/areas
- Having integrated preceding different methods and different studies
- Delivering a methodology (a system of methods) which integrates various thinking methods, techniques, tools, etc.
- Easy to learn, easy to apply, and effective in actual jobs of application.

Six-Box Scheme of Creative Problem Solving



"A General Methodology for Creative Problem Solving & Task Achieving"



Principal strategies for establishing it:

- (A) As the paradigm (or basic scheme), we adopt the 'Six-Box Scheme'.
(=< Conventionally the 'Four-box scheme' in science & technology, and TRIZ)
- (B) We build one for technology and another for non-technology, in parallel.
- (C) Based mainly on the data-flow representation. (<= flow-chart)
 - Clarifying the input, intermediate, and output information.
 - Specifying the concepts and methods for representing information.
- (D) The ways and processes for acquiring/deriving information may have multiple alternatives. (Allow different alternative processes.)
- (E) Take care of mental/psychological aspects of problem solvers and stakeholders.
- (F) Establish first the methods in the Thinking World in the Six-box scheme and then the connections to the pre/post methods in the Real World.
- (G) We first analyze and describe the methods in TRIZ/USIT under these strategies, and then various other conventional methods.

CrePS (General Methodology of Creative Problem-Solving)

Main Part: In the Thinking World (Box-2 ==> ==> Box-5)

For technological problems

- (0) Whole procedure
- (1) Finding the problem
- (2) Understanding the present system
- (3) Imaging the ideals
- (4) Generating ideas
- (5) Constructing solutions

For non-technological problems

- (0) Whole procedure
- (1) Finding the problem
- (2) Understanding the present system
- (3) Imaging the ideals & **visions**
- (4) Generating ideas
- (5) Constructing solutions

We should build these two in parallel.

Essential components of the two are very similar.

(B) Main part of the CrePS methodology (Technological) (in the 'Thinking World') Box-2 ==>==>==>Box-5

(0) The whole process

- 0-1 Systematic/compound whole processes
- 0-2 Simplified/customized whole processes

(1) Grasping the problem (Box-2)

- 1-1 Setting up the project for problem solving/task achieving
- 1-2 Grasping the problem in a systematical way
- 1-3 Setting up the purposes and tasks
- 1-4 Considering in a wider scope
- 1-5 Setting the focal points
- 1-6 Understanding the resources and constraints

(B) Main part of the CrePS methodology (Technological)

(2) Understanding the present system (Box-3)

- 2-1 Understanding the difficulties and the root causes
- 2-2 Understanding the mechanism of the present system
- 2-3 Understanding the space and time characteristics
- 2-4 Understanding the functions and attributes
- 2-5 Clarifying the difficulties and contradictions
- 2-6 Examining various existing methods
- 2-7 Surveying similar tasks and their solutions in different areas

(3) Getting images of the ideals (Box-3)

- 3-1 Reconfirming the tasks and goal directions
- 3-2 Considering images of the ideals
- 3-3 Considering desirable behaviors and properties
- 3-4 Considering the directions of evolution

(B) Main part of the CrePS methodology (Technological)

(4) Generating ideas (Box-4)

- 4-1 Techniques (and attitudes/minds) for generating ideas
- 4-2 Generating ideas by the help of hints
- 4-3 Generating ideas by the help of guide lines
- 4-4 Generating ideas which solve contradictions
- 4-5 Generating ideas systematically and exhaustively
- 4-6 Identifying good ideas.

(5) Constructing conceptual solutions (Box-5)

- 5-1 Extending the ideas
- 5-2 Building improved solutions by introducing the ideas
- 5-3 Introducing good solutions from different areas
- 5-4 Designing new solutions on the basis of the ideas
- 5-5 Solving secondary problems
- 5-6 Evaluating and identifying good solutions
- 5-7 Writing reports and proposals of the CrePS project

(A) Initial part of CrePS (Technological) (in the 'Real World') Box-1 ==> Box-2

(0) Basic targets of the CrePS methodology

(1) Grasping problems in the real world and preparing for solving them creatively (Box-1)

(2) Connecting processes of technological development with CrePS (Box-2)

(3) Connecting technological development methods with CrePS (Box-2)

(4) Connecting education with CrePS

(5) CrePS itself being established

(6) Starting CrePS projects (for working in the 'Thinking World')

(C) Succeeding part of CrePS (Technological) (in the 'Real World') Box-5 ==> Box-6

- (0) Basic outputs of CrePS projects in the Thinking World**
- (1) Reporting and accepting the CrePS project outputs (Box-5)**
- (2) Evaluating the conceptual solutions (Box-5) in the Real World**
- (3) Extending them to build new solution plans**
- (4) Using various methods for building actual solutions (Box-6)**
- (5) Examining and then implementing the new solutions
in the Real World (Box-6)**
- (6) Manufacturing, Marketing, etc. of the implemented solutions
(Box-6)**

Concluding Remarks

- (1) 'General Methodology of Creative Problem-Solving / Task-Achieving' (CrePS) is an integration of many existing methods, including TRIZ, with the basic paradigm of the 'Six-Box Scheme'.
- (2) The Main part of CrePS (from problem to conceptual solutions, in the Thinking World) is relatively well known in TRIZ/USIT and can be enhanced by the integration of various other methods, to give a useful methodology.
- (3) The Initial part of CrePS (for grasping the problem in the Real World) is the focus of recent investigations and practices to find ways of grasping problems under complex situations for different purposes.
- (4) The Succeeding part of CrePS (for implementing the solutions in the Real World) reflects the corporate activities in technology and business.
- (5) It is important to provide simplified and effective ways of practice in CrePS depending on different purposes of usage.
- (6) I wish you to share the vision and to cooperate for establishing the general methodology of creative problem solving (CrePS).



Thank you for your attention

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