

Evaluating and organizing thinking tools in relationship to the CPS framework: An executive summary of Barbero Switalski's 2003 master's project

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Introduction

This project surveyed, analyzed and organized thinking tools drawn from several areas of theory and practice within the new proposed framework for Creative Problem Solving (CPS).

The latest development of CPS (Puccio, Murdock & Mance, personal communication, February 7, 2002) repositions the CPS framework as a model for developing thinking skills. The new skill-based version of CPS comprises seven steps each of which has been associated with a thinking skill, as it is shown in Table 1.

Table 1 – The New CPS Framework

NAME OF THE STEP	PURPOSE	THINKING SKILL
Assessing the Situation	<ul style="list-style-type: none"> • To describe and identify relevant data; and • To determine next process step 	Diagnostic Thinking Examining a situation closely and using this analysis to decide on what process step to take next
Exploring the Vision	To develop a vision of a desired outcome	Strategic Thinking Establishing a future direction and the outcome(s) one desires to attain.
Formulating the Challenges	To identify the gaps that must be closed to achieve the desired outcome	Problem Analytic Thinking Framing a problem into a springboard for idea generation.
Exploring Ideas	To generate novel ideas that address significant gaps/challenges	Ideational Thinking Producing original mental images and thoughts that respond to challenges or opportunities
Formulating Solutions	To move from ideas to solutions	Evaluative Thinking Assessing the reasonableness and quality of ideas in order to develop workable solutions
Exploring Acceptance	To increase the likelihood of success by testing solutions	Contextual Thinking Understanding the interrelated conditions and circumstances that will support or hinder success
Formulating a Plan	To develop an implementation plan	Tactical Thinking Devising a plan in specific and measurable steps for attaining a desired end and monitoring its effectiveness

This approach significantly broadens the boundaries of CPS which evolves from a relatively 'closed system' with its own process steps and tools to an inclusive conceptual framework that can absorb thinking tools already in use in other models and processes, inside the realm of creativity (i.e. idea generation tools) as well as in other areas of theory and practice (i.e. problem solving, quality improvement, decision making tools). The application of these tools can help focus and sharpen the thinking skills related to each step of the process, thereby contributing to the continuous development of such skills.

This project focused on the effort of linking CPS to other areas and constructs, by surveying, collecting and analyzing existing thinking tools and by organizing them within the steps and the thinking skills proposed by the new CPS framework. By doing that, this project aimed to fill the need for widening and enriching the existing array of tools that can be applied within the CPS process.

Method and Steps for Conducting the Study

The methodology adopted for this study involved several steps:

Step 1- Preparation : The first phase focused on establishing the main parameters for selecting and analyzing thinking tools. It was determined that the selection and analysis of the tools would be based on the comparison between the language used for describing the purpose of the thinking tool and the language used to define the purpose of the step, the related thinking skill and the divergent or convergent category within which the tools would be classified. A literature review was conducted to identify preliminary thinking skills definitions.

Step 2- Validation: A focus group with CPS 'experts' (Creative Studies alumni and majors) was then carried out in order to validate and refine the preliminary thinking skill definitions identified through the literature review. The final version of the thinking skill definitions utilized for this study is displayed in Table 1.

Step 3- Data Collection & Selection: The literature review focused on Total Quality Management (TQM), Strategic Management, Problem Solving, Decision Making, and Creativity Processes and Methods, other than CPS. In order to guide and narrow down the tools selection, a goal of six tools per step, other than the 'classic' CPS tools, was set and a list of criteria was developed. The main criteria considered for the tools selection concerned the distinctiveness and diversity of the thinking tools to be chosen:

there was a deliberate effort to collect thinking tools that were serving different purposes, across the seven steps of the CPS framework, and that were clearly distinct from one another within each step of the model.

Step 4 - Data Analysis and Organization: Next, each tool was analyzed to assess how it aligned with the new framework for CPS and, specifically, to locate the step of the CPS framework where that tool could be coherently integrated as well as to classify that tool by divergent or convergent category.

Step 5- Data Presentation and Description: Finally, each thinking tool was presented and described in a Table, by providing the following information: name, purpose, function, category (divergent/ convergent), sources and remarks. A graphic representation of the tool was displayed in a Figure, when a visual illustration was considered necessary for a clear description of the tool.

Project Findings and Recommendations for Future Studies.

Forty-four thinking tools, other than the 'classic' CPS tools, were collected, analyzed, described and categorized within the seven steps of the new CPS framework, according to the main categories of divergent and convergent thinking. An overview of the project findings is presented in Table 2.

Table 2 shows a wide array of thinking tools drawn from several areas of the literature that can enrich the 'classic' CPS toolbox and be applied within the CPS process. Many other tools are available in the literature and can be added to this first collection proposed by this project. Future studies that intend to broaden this collection might focus on achieving a higher balance between divergent and convergent tools within each step of the process. Particularly, two steps of the new CPS framework call for finding or developing more divergent or convergent tools that can support the accomplishment of the purpose stated by that step:

Table 2 – Overview of Project Findings

NAME OF THE STEP	DIVERGENT TOOLS	CONVERGENT TOOLS
Assessing the Situation	WHY-WHY diagram; Phoenix Checklist. (*)	Fishbone Diagram; Stratification; Affinity Diagram; Is/Is not Matrix; FCB grid. (*)
Exploring the Vision	Drawing Forth Personal Vision; Creating a Vision for the Organization; Imagineering; Cartoon Story Board; Mindscapes; Imaginary journalism. (*)	Opportunity Analysis.(*)
Formulating the Challenges	Multiple redefinition; Goal orientation; Boundary examination; False faces; Reframing Matrix. (*)	Toothache Tree. (*)
Exploring Ideas	Brain sketching; Cherry Split/Two words; Board of directors; Rolestorming ; Greeting Cards; Concept Fan; Circle of opportunity.(*)	
Formulating Solutions		Cost -Benefit Analysis; Solution Effect Analysis; Decision Balance Sheet; Spider Diagram; Screening Matrix; Plus, Minus, Interesting (PMI).(*)
Exploring Acceptance	OPV (Other People's View). (*)	Force-Field Analysis; Stakeholder Analysis; Commitment Chart; Opus;Potential-Problem Analysis (PPA). (*)
Formulating a Plan	How- How Diagram.(*)	Gantt Chart; Critical Path Analysis (CPA); Improve Internal Process Plan (IIP); Performance Dashboard.(*)
	22 DIVERGENT TOOLS	22 CONVERGENT TOOLS

(*) See the reference list for sources from which the tool summaries were created.

- Formulating the Challenges appears like a more ‘concrete’ step for which more convergent tools that can support the proper ‘formulation’ of the final statement of the challenge would be required;
- Conversely, Exploring Acceptance appears like a more ‘conceptual’ step for which more divergent tools that can foster a broader ‘exploration’ of sources of assistance and resistance to a proposed change or solution would be needed.

Finally, an important endeavor that might follow this project concerns the verification and adaptation of the thinking tools proposed through this collection within the facilitation of the CPS process. All the thinking tools presented through this project were drawn from other areas of theory and practice: their application within the CPS framework needs to be carefully assessed and adapted according to the guiding principles provided by this model. The challenges that lie ahead could be stated as follows: “How to apply thinking tools in a flexible way and consistently with the theoretical elements of the context in which they have been integrated”? “How to creatively adapt the application of a tool drawn from another discipline within the facilitation of CPS?”. It is the hope of the author of this project that other colleagues will continue along the pathway of research initiated through this study and will be eager to undertake the challenges here presented.

References

- Beckard R., & Pritchard, W. (1992) *Changing the essence: The art of creating and leading fundamental changes in organizations*. San Francisco: Jossey-Bass.
- de Bono, E. (1982) *Lateral Thinking for Management*. London: Penguin Books.
- de Bono, E. (1992) *Serious creativity: Using the power of lateral thinking to create new ideas*. New York: Harper Business.

- de Bono, E. (1994) *De Bono's thinking course*. New York: Facts on File.
- Dick, B. (1997) *Stakeholder analysis*. Retrieved October 30th, 2002 from <http://www.scu.edu.au/schools/gcm/ar/arp/stake.html>
- Goetsch, D.L & Davis, S. (1994). *Introduction to total quality: Quality, productivity, competitiveness*. New York: Merrill.
- Higgins, J (1994). *101 Creative Problem Solving techniques*. Winter Park, FL: New Management Publishing Company.
- Ishikawa, K. (1985). *Guide to quality control*. Tokyo: Asian Productivity Press.
- Janis, I. L., & Mann, L. (1977). *Decision Making*. New York: Free Press
- Kanji, G. K. & Asher, M. (1996). *100 methods for Total Quality Management*. London: Sage.
- Kepner, C. H., & Tregoe, B. B. (1976). *The rational manager*. Princeton, NJ: Kepner-Tregoe, Inc.
- Kepner, C. H., & Tregoe, B. B. (1981). *The new rational manager*. Princeton, NJ: J. M. Publishing.
- Lewin, K. (1951). *Field, theory and social science: Selected theoretical papers*. New York: Harper & Row.
- Mason, R. O., & Mitroff, I. L. (1981). *Challenging strategic planning assumptions: Theory, cases and techniques*. New York: Wiley.
- Majaro, S. (1991). *The creative marketer*. Oxford: Butterworth-Heinemann.
- Michalko, M. (1991). *Thinkertoys*. Berkeley, CA: Ten Speed Press.
- Mindtools. *Creativity tools*. Retrieved July 20, 2002 from http://www.mindtools.com/pages/main/newMN_CT.htm
- Mindtools. *Techniques for effective decision making*. Retrieved July 20, 2002 from http://www.mindtools.com/pages/main/newMN_TED.htm

- Mindtools. *Project planning and management tools*. Retrieved July 20, 2002 from http://www.mindtools.com/pages/main/newMN_PPM.htm
- Rickards, T. (1974). *Problem-solving through creative analysis*. New York: Wiley.
- Segal, M. (2001). *Creativity and personality type: Tools for understanding and inspiring the many voices of creativity*. Huntigton Beach, CA: Telos.
- Senge, P. M., Kleiner, A., Roberts, C., Ross, R. B., & Smith, B. J., (1994). *The fifth discipline fieldbook: Strategies and tools for building a learning organization*. New York: Doubleday.
- Senge P. M, Kleiner A., Roberts C. , Ross R. , Roth G., & Smith B. (1999). *The dance of change: The challenge of sustaining momentum in learning organizations*. New York: Doubleday.
- Switalski, L. B. (2003). *Evaluating and organizing thinking tools in relationship to the CPS framework*. Unpublished master's Project, State University of New York- Buffalo State College; International Center for Studies in Creativity.
- Technique Library Homepage. Retrieved July 15, 2002 from The Open University website: <http://www5.open.ac.uk/b822/>
- Van Gundy, A. B. (1988). *Techniques of structured problem solving*. New York: Van Nostrand Reinhold.
- Van Gundy, A. B. (1992) *Idea power: Techniques and resources to unleash the creativity in your organization*. New York: American Management Association.
- Whiteley, R. C. (1991). *The customer driven company: Moving from talk to action*. Reading, MA: Addison-Wesley.
- Wycoff, J. (1995) *Transformation thinking: Tools and techniques that open the door to powerful thinking for every member of your organization*. New York: Berkley Books.