Problems that are Puzzles

One of the 8 problem types defined on www.problemsolving2.com, a website created by Jerry L. Talley.
These pages outline the essential nature of the problem and the best process for addressing it.

Definition	Problems for which the cause-and-effect chains are relatively well known and bounded. The relevant variables are largely known or knowable. There is a method, procedure or algorithm which will most likely find an answer. The biggest task is often finding and employing the right method. Once found, a solution would be immediately obvious or valid to all competent observers. Such problems are most common in mechanical engineering, finance, mathematics, some areas of science. It is possible to dissect the problem into its component parts and solve each sub-problem separately. Solutions can be recycled. For example, benchmarking and "best practices" are strategies for finding existing solutions and importing them for re-use in a new situation. The method employed and the solution found will be independent of the problem solvers, that is, the personal characteristics of the problem solvers will not taint or void the outcome. Once solved, the problem solvers can disperse to take on new challenges. That is, the solution can be captured and implemented without requiring the continued involvement of the problem solvers.
Examples	• Getting a man to the moon and back home safely • Creating a ½" disk drive • Process improvement efforts • Analyzing and repairing simple systems (mostly linear causality, known variables, and few feedback loops) such as a manufacturing line
Challenges	• Ensuring the problem solvers have the requisite skills and information • Getting a stable definition of the solution / goal / outcome • Fostering creativity, full communication • Deciding whether to use a group or a single expert • Avoiding any contaminating group dynamics (i.e. interpersonal animosity, functional cliques) or extraneous political or personal agendas. For example, people sometimes use problems (and their solutions) as ways to build reputation or defend turf
Definition of Good Outcome	The problem is solved: it works, flies, runs, adds up, clicks, whirrs, turns on, etc. There is confidence that the solution is at least adequate, if not the best available. The solution was reached using accepted if not standard methods. The relationships among the problem solvers are enhanced or at least not damaged. The problem solvers disperse to attend to other matters.
False Solutions	Common models for problem solving are rather impoverished; it is easy for a group to use only a small portion of the potential "solution space" they might explore. They may fall into taking the first option found ("satisficing").
Typical Identification Errors	We like problems to be puzzles -- so much so, that we are likely to force a problem into this category even when it belongs elsewhere. Be careful to consider other categories thoroughly. Conversely, when you find a Puzzle piece in a more complex problem, flag it and fix it!

JLTalley & Associates – Jerry@JLTalley.com – 650.967.1444

When to Exit	• The technology may be too far into the future to be commercially viable. In other words, the search for the needed "tool kit" may be best left to not-for-profits and academic institutions. • There is such strong contamination from personal agendas or internal politics that the effort is most likely to run aground even if a technical solution is found.

JLTalley & Associates – Jerry@JLTalley.com – 650.967.1444

Problem Solving Process for Puzzles

	Leader / Sponsor	Individual Contributors	Neutral Party
			The role of a facilitator may need to be part of the initial framing. That is, they need to clearly articulate and even negotiate for their role in guiding the process without advocating for a particular solution. Their authority is nothing more than the agreement of the group to allow them to aid their collective effort.
Exploring the Problem		The key tasks are exploring the perception and definition of the problem. • *Who* considers the situation problematic? Who does not? • What are the underlying assumptions or models within which this situation is problematic? Are there other models within which the situation is *not* problematic? • Why is it considered problematic *now*? Was the situation ever tolerated or accepted? • What forces maintain the situation as it is? What has prevented the situation from improving on its own? • What are the criteria for a solution? • Are we still confident the problem is a Puzzle type? Are there non-technical aspects or constraints to be managed?	The most common approach people take in problem solving is to debate the merits of alternative solutions. The facilitator's role is to bring people back to understanding the problem without committing too early to a particular solution. Where solutions are the most prevalent focus, the facilitator can use them to work backwards to the problem presumably corrected by a preferred solution.

JLTalley & Associates – Jerry@JLTalley.com – 650.967.1444

	Leader / Sponsor	Individual Contributors	Neutral Party
Considering Options	As the team explores options, they may well bump into possibilities that would challenge something considered sacred in the organization. In process design work, for example, a possible improvement may violate a legacy system in the organization, possibly even one designed by the current leadership. It is the leader's role to ensure the group is empowered to explore all options, even those that would pose a threat to executive egos.	(In some cases, the problem may already be solved! There is no reason to start from a blank sheet of paper when the solution exists somewhere else. During the Exploration phase, identifying the relevant expertise and/or identifying existing solutions may provide a cost- and time-efficient way out. For example, benchmarking for process improvement is a way of solving a Puzzle problem by finding a best solution already worked out somewhere else.) • Generating options (the prototypical activity is brainstorming) • Extracting criteria for evaluation (why do we favor the options we do?) • Forming and reforming options (using the criteria to reconfigure options so they optimize on the criteria) A key step is letting the brainstorming session help to clarify underlying (and often unarticulated) criteria. That is, the options people like most will reveal the dimensions most critical in a final solution. Using those identified dimensions, the next step is to revisit the list of options and recombine them in ways that maximize the outcome criteria.	Creativity is quite natural for people, provided the group process does not stamp it out through fear of criticism or of simply looking foolish. It is the role of the Facilitator to structure a process where people are free from fear of evaluation and willing to allow their ideas to cross-fertilize. This phase is characterized by a tension between being open and creative vs. seeking closure. The Facilitator must structure a process that manages that tension. If there are unresolved issues in the relationships among the participants, this phase is certain to bring those to the surface. The Facilitator needs to watch for emerging cracks in working relationships.
Implementing Solutions	As the change effort moves into implementation it has to be dovetailed in with all the existing work of the organization.	At this point the process begins to resemble a more traditional project: define tasks, assignments to individuals, define intermediate products, set deadlines, coordinate resources. All the tools for good project management become applicable.	The Facilitator may want to schedule a review of progress to allow mid-course corrections and possibly to refresh the understanding of the problem.

JLTalley & Associates – Jerry@JLTalley.com – 650.967.1444