U-SIT And Think News Letter - 34

Updates and Commentary

Unified **S**tructured **I**nventive **T**hinking is a problem-solving methodology for creating unconventional perspectives of a problem, and discovering innovative solution concepts, when conventional methodology has waned.

Dear Readers:

- My apologies for recent repetitious mailings. Things will get straightened out eventually – I hope!
- The registration section of www.u-sit.net, for ordering free ebooks in English or Spanish and receiving periodical newsletters, is working as far as it has been tested. Please send an email if you discover otherwise. By the way, the new website uses HTML frames. Does this cause anyone problems?

3. Mini USIT Lecture – 34

"USIT – an Alternative Method for Solving Engineering-Design Problems"

Continuation of **How to Invent** …

Recap of Mini USIT Lecture 34
On our journey to innovate drinking vessel concepts through analysis of plausible functions of artifacts we arrived at [SCF10] (ref. NL_23). For this characteristic, "polymer", two functions were listed both having the word "cost" in them. I vented my feelings about "cost" not being a well-defined problem. Then I started a discussion based on left-brain analysis and aborted it to entertain a right-brain analysis of the problem. I'd like to discuss the subject more fully in this lecture.

Mini USIT Lecture 34 "Left-brain/right-brain influences in problem solving"

By way of introduction let me summarize some fascinating pedagogy from the field of art.

Art professor, Dr. Betty Edwards, discusses left-brain impediment to drawing and has developed effective pedagogy for teaching how to suppress it. ["The New Drawing on the Right Side of the Brain", Betty Edwards, Jeremy P. Thatcher / Putnam, New York, 1999.] She points out that many people take a left-brain approach to drawing. They try to make their drawings perfect by judging their progressive steps in a drawing against preconceived (logical) ideas of what the subject being sketched is supposed to look like. This left-brain control preempts right-brain attempts to sketch what is actually being seen. An effective tool to demonstrate and overcome this is to copy a drawing with the drawing turned upside down to thwart left-brain judgment. I have tried her ideas with surprisingly

satisfactory results.

The brain hemispheres play both contradictory and complimentary (or different) roles in problem solving. (Art also is problem solving.) Of their many traits the following will be focused on here.

Left-brain thinking in problem solving uses logic, linear reasoning, and verbalization. Right-brain thinking exercises a holistic view of a problem, deals in metaphors, and is creative but non-verbal. Both hemispheres understand objects but in different ways. Left-brain names every part of an object and verbalizes these names to establish classification and object differentiation as they are manipulated mentally. Complex objects are analyzed in terms of component objects with logical, rigorous rational.

Right brain is not verbal. It "sees" the spatial relationships of objects as it develops a holistic view of a problem situation. It synthesizes complex objects in a more plastic fashion with patience to await the outcome rather than submit to logical, rigorous filtering. Thus, the right brain is more adept at dealing with metaphors for creative thinking.

It strikes me that the right brain invents situations that the left-brain accepts or vetoes. Furthermore the left-brain defends its ideas with verbal argument giving it an edge over the silent right-brain.

It is interesting that both brain hemispheres simultaneously receive the same information from our five senses. As they process this information, they simultaneously share their ideas over their connecting communication line, the corpus callosum. Each is aware of what the other is doing. However, the left brain "writes up the report", so to speak, for conscious criticism and editing.

Some important guidelines, or heuristics, can be drawn from these observations, which are applicable to innovative problem solving.

Our bent for logical reasoning, our technical training, our nomenclature for everything we encounter, the pride we take in being rational, all stem from left-brain dominance. The structure of structured problem solving is an example of left-brain thinking. It seems that our professional careers in technical fields thrive on left-brain dominance. Whereas, it appears, the arts flourish from right-brain dominance.

Taking dominance to a simplistic extreme, we could conclude that the sciences are logical where the arts are creative; or, technologists are not creative where artists are not logical. I have no supporting data, but from my experience I find that technologists are far more logical than creative. An example from industry that supports my view is simply the small number of patents issued among a relatively large population of technologists.

I'll stay with this extreme view for a moment to suggest that to be more creative we need to be less logical. To be innovative we need to suppress left-brain thinking and encourage right-brain thinking.

If you recall your first reading of USIT you may remember features designed to accomplish this suppression. One feature is to name objects for their functions rather than to use common non-

function names. This activates metaphorical thinking – a right-brain activity. Of course, we always insist on no filtering of solution concepts – a left-brain activity. The names of USIT problem-solving techniques were chosen for metaphorical value: pluralization, dimensionality, distribution, transduction, generification, and uniqueness. Particles are metaphors. If you read, "Heuristics for Solving Technical Problems – Theory, Derivation, Application" (available free at www.u-sit.net), you'll find metaphorical thinking taken to the extreme. An example is representing objects in problem sketches as empty boxes (no names). Another is focus on attributes rather than objects. Of course attributes can be given very technical names – logical, left-brain thinking. But they also can be given generic names to suppress left-brain dominance and give the right brain a chance at metaphorical thinking.

[The following three paragraphs are taken from "Heuristics for Solving Technical Problems – Theory, Derivation, Application".]

"In the idea-generation phase one needs as much freedom of association with past experience as can be evoked in the subconscious for unusual recall. An excellent heuristic for this purpose is the use of "*ambiguity*". One form of ambiguity is known as "*generification of object names*" (Table 1, No. 8). That is, referring to objects not by their commercial names but by generic names that reflect their functions. For example, a mechanical screw might be named

a clamp, a fastener, a marker, an adjuster, a pivot, a support, a pump, a balance weight, a point of reference, a hole filler, or a propeller,

according to its main use in a given problem.

Each generic object name becomes a seed to spark the subconscious. At this juncture, minds diverge through individual-dependent backgrounds of experience. The generification of an object's commercial name according to its application will produce rather similar results among different problem solvers, but the subsequent sparks of imagination can vary in surprising ways. As an example, consider one of the above generifications of a mechanical screw: say, a "fastener". In quick succession (without filtering), these ideas came to my mind:

a gate latch, a staple, a railway spike, a Cleco button, a safety pin, a straight pin, a tack, a ratchet, Velcro®, a belt buckle, a mechanical detent, a cog, a knot, a welded joint, a bottle cap, a shoe string, a skewer, a shoe stuck in mud, a rivet, a friction joint, a differential thermal-expansion joint, and …

(I quit when the rate of ideas slowed). Note that some of the "sparks" produced sequences in which one idea gave rise to the next. Hence, a subsequent idea may appear to be disconnected from the original one. The purpose of this demonstration is to show that some resulting associations may seem logical to the reader and others may not. All were logical to me for specific reasons (personal experience). Such variability among individuals should be borne in mind when judging whether a proffered solution concept follows logically from a specific heuristic.

A major benefit of the use of ambiguity to invoke broad associations is to suppress the rigor of engineering-type analysis. Presumably, when a problem solver has reached the point of applying a structured problem-solving methodology, rigorous engineering-type thinking has been already exploited and useful ideas captured. The strategy now is to shift to an

unconventional approach that is not whimsical and that retains phenomenological validity."

Another feature for suppressing left-brain dominance is focus on attributes rather than objects. Of course attributes can be given very technical names – logical, left-brain thinking. But they also can be given generic names to suppress left-brain dominance and allow the right brain a chance at metaphorical thinking.

I believe that right-brain thinking impedes but does not prevent creative problem solving. Using the heuristics described above and others, while understanding the goal of thwarting left-brain dominance, we can effect much more innovation in problem solving. In the process we can develop innovative concepts that are logical. I will comment more on left-brain / right-brain thinking in future lectures.

****** To Be Continued in the next USIT Newsletter ******

8. Other Interests

1. Regarding inquiries about ordering the book, "Unified Structured Inventive Thinking – How to Invent", details may be found at the Ntelleck website: www.u-sit.net. The cost of the book is US$44.50 plus shipping and handling. See the website for S/H charges. Send a check made out to **Ntelleck, LLC** for the proper amount, drawn on a US bank, to
   Ntelleck, LLC, P.O. Box 193, Grosse Ile, MI 48138 USA

2. A **Public USIT Course**. If you are interested in a public 3-day USIT course to be taught in Novi, Michigan (convenient to Detroit Metro Airport) please send an email. (Recent courses have been taught as on-site events in private corporations.)

3. Professor Toru Nakagawa, of the Osaka Gakuin University, and Mr. Hideaki Kosha, of Fuji Photo Film, Co., are translating the U-SIT NewsLetters into Japanese;
   Professor Keishi Kawamo, Professor Shigeomi Koshimizu and Professor Toru Nakagawa have translated the ebook, "Unified Structured Inventive Thinking – an Overview into Japanese; both translations are being posted at www.osaka-gu.ac.jp/php/nakagawa/TRIZ/

4. Yong-Taek Park informs me that he has completed translation of USIT Newsletters from NL_01 through NL_13 into Korean. They are available at www.ktriza.com.

5. Two USIT ebooks translated into Spanish are available at www.u-sit.net:
   "Pensamiento Inventivo Estructurado Unificado – Una Apreciación Global", y
   "Heurísticas para Resolver Problemas técnicos – Teoría Deducción Aplicación",
   traducido por Juan Carlos Nishiyama y Carlos Eduardo Requena.

Please send your feedback and suggestions to Ntelleck@u-sit.net and visit www.u-sit.net

To be creative, U-SIT and think.