



Updates and Commentary

- 1 USIT – How to Invent
- 2 USIT – an Overview
- 3 Mini Lecture
- 4 Classroom Commentary
- 5 Heuristics for Solving Technical Problems
- 6 Feedback
- 7 Q&A
- 8 Other Interests

U-SIT And Think News Letter - 43

Unified Structured Inventive Thinking is a problem-solving methodology for creating unconventional perspectives of a problem, and discovering innovative solution concepts, when conventional methodology has waned.

Dear Readers:

News from Argentina: Juan Carlos Nishiyama y Carlos Eduardo Requena have translated into Spanish newsletters NL_20 to NL_32 as a group. These newsletters have the mini-lectures that discuss how to invent a new drinking vessel. They are available at the Ntelleck website:

www.u-sit.net (click on) Registration

Yes, back issues of this newsletter are available on request.

3. Mini USIT Lecture – 43

USIT – a Method for Solving Engineering-Design Type Problems

I. Continuation of Plastic Heuristics

Lest these mini-lectures become too theoretical or esoteric, I'll take a moment to define "plastic heuristics" using an example.

A very well known heuristic is to step through the alphabet, letter by letter, as one tries to seed the subconscious to recall a name. This is a specialized heuristic and therefore is not plastic. However, we can generify this heuristic to render it "plastic". Note, that there are other heuristics used to recall names. Can you think of any? Here's one: the way you stroke the name when writing it.

In this example a name is information. Remember that information is an object in USIT. Objects are characterized by their active attributes. One attribute of the object "name" is the first letter of its spelling. Other attributes, for example, are its language, its pronunciation, its punctuation (hyphen, capitalization, and special marks), its number of syllables, etc. When stepping through the alphabet letter by letter we are approximating mentally the sound, pronunciation, and visual shape of the first letter of the name to be recalled. Momentarily we are ignoring the name and are focusing on its first letter. This too is an information object having its own active attributes, which are sound, pronunciation, visual shape, and perhaps others. Note that we are attacking this recall problem in two stages; 1) first-letter recall and 2) name recall.

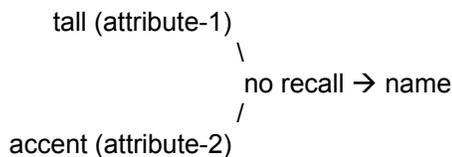
As long as this heuristic is remembered and applied to the first letter of a name it is not a plastic heuristic. So, let's generify it by first finding out how it works.

Our problem is recall of a name. The unwanted effect is momentary loss from memory of a name learned at some earlier time. But what does recall mean? Recall usually occurs automatically as we think about interacting objects, for example.

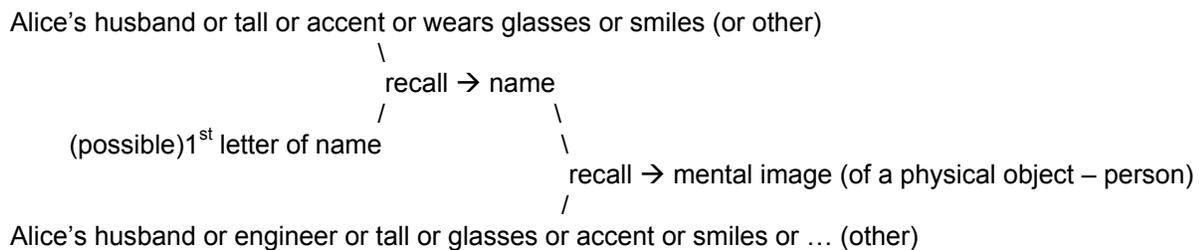
At the party, Mary introduced me to Alice’s husband who is an engineer; but I can’t think of his name. He’s tall, wears glasses, speaks with an accent, and smiles a lot.

In these contrived thoughts, the speaker is trying to recall a name by identifying attributes already associated with Alice’s husband. Note that the names Mary and Alice came to mind automatically but the third name did not. The attributes Alice’s husband, engineer, tall, wears glasses, speaks with an accent, and smiles a lot also came to mind automatically but were inadequate to generate recall of their associated name object. In this type of recall one is attempting to assemble a mental image (information object) from a collection of attributes. A key attribute for this situation is a person’s name. For recall to work, some set of active attributes attributable to the information object must have already been committed to memory. Some of these, maybe not all of them, are needed for recall. Once the name is remembered, a larger set of active attributes associated with the person come to mind.

Our problem can be sketched as follows for one particular pair of attributes.



Note that *Alice’s husband* and *engineer* and *tall* and *glasses* and *accent* and *smiles* are attributes of the desired information object *name*, these attributes along with *name* are attributes of the information object *mental image*. No recall is an unwanted effect. Recall is a function, a desired effect. The strategy of the subject heuristic is to discover a first letter of name that combined with a known attribute produces recall of name. Then name combined with an already recognized attribute produces the desired mental image – a larger assembly of active attributes.



As illustrated in the above diagram we begin with a pair of attributes to recall (generate) an associated attribute, name. The generated attribute is combined with another associated attribute to generate yet another associated attribute, mental image. So, what is going on in a generic sense?

Now I’m out of space, so, as they used to say in old radio serials, “Tune in next week and find what happens in this thrilling mystery!” -☺-

***** to be continued *****

II. Continuation of Left-brain Right-brain Participation in Solving Technical Problems Using Plastic Heuristics

Intuitive, brainstorming, and structured problem solving are, for the most part, object-centered, problem-solving methodologies. In these lectures I am examining an alternative approach to an attribute-centered focus. The purpose of this shift of focus is to investigate new opportunities in problem solving in order to broaden our search for creative concepts.

The second stage of our inquiry into whether attribute associations contribute to creative problem solving was stated in the last lecture (in NL_42):

Do logically associated pairs of attributes generate relevant associations of a third attribute?

To be logically associated, we need to select pairs of attributes that comply with our model of attribute-attribute interaction through contacting objects. Three problem situations were proffered for which we were to generate a triplet of associated attributes.

1. The *vapor pressure* of a liquid coating and the *absorptivity* of the substrate it coated led to premature drying of the coating and its subsequent cracking. Does this pair of attributes bring to mind a third attribute in a causal relationship? More than one triplet may be found.

I thought of *vapor pressure*, *absorptivity*, and *thermal conductivity* (for transferring heat from the substrate to the coating to cause premature drying).

2. Cellophane *tape*, pulled from a *spool* and cut to length, becomes unmanageable as it coils back on itself and sticks to itself or to one's *hands*. Do you see plausible pairs of causal attributes? Do they lead to associated triplets?

I thought of *electron bond strength*, *electrical conductivity* (in this case, low conductivity or insulation), and *surface charge density*. These interact during "pulling of tape" to produce localized surface charges that then attract each other.

3. Two things are difficult to engage when in a view-obstructed area. Do you see plausible pairs of causal attributes? Do they lead to associated triplets?

I thought of *roughness*, *applied force*, and drop in *tactile feedback* on engagement.

Notice the difference in these three exercises. The first gives specific contacting *attributes*, the second gives specific contacting *objects*, while the third gives neither in an attempt to be more generic or ambiguous. Which of these, if any, make it easier to throttle logical criticism of left-brain and give right-brain more freedom?

As I began thinking about combination (3) several different situations that seem to fit its conditions came to mind: buttoning my jacket in the dark; stirring something at the bottom of an opaque liquid; tying my shoes in the dark; cleaning a torch nozzle with a twist drill while wearing a welding mask; and shifting gears by hand in heavy automobile traffic, are examples. Whereas in thinking about (1) and (2) no analogous situations came to mind. (Looks like RB poetry!)

We are ready now to investigate the question ...

Do logically associated pairs of attributes from an unwanted effect generate creative associations of a third attribute that sparks solution concepts?

When an axe is given high angular velocity, during chopping of wood, there is danger of the metallic head separating from the wooden handle.

Identify one or more pairs of causal attributes of this unwanted effect. Do any of these pairs bring to mind an associated attribute? Does examination of the third attribute bring to mind any solution concepts? How many pairs of causal attributes can you identify? How many of these lead to solution concepts?

----- LB/RB Participation in Solving Technical Problems Using Plastic Heuristics will be continued. -----

7. Feedback

Note, no one responded to my query of how to remove the black bar to the left of this sentence.

(The above quote was cut & pasted from Outlook Express. The black bar on the left came with it. Does anyone out there know how to remove the black bar?)

8. Other Interests

1. Have a look at the USIT textbook, “Unified Structured Inventive Thinking – How to Invent”, details may be found at the Ntelleck website: www.u-sit.net (Note; not www.ic.net)
2. [USIT Resources](#)

Publications	Language	Translators	Available at ...
1. Textbook: Unified Structured Inventive Thinking – How to Invent	English	Ed Sickafus (author)	www.u-sit.net
2. eBook: Unified Structured Inventive Thinking – an Overview	English	Ed Sickafus (author)	www.u-sit.net
	Japanese	Keishi Kawamo, Shigeomi Koshimizu and Toru Nakagawa	www.osaka-gu.ac.jp/php/nakagawa/TRIZ/
“Pensamiento Inventivo Estructurado Unificado – Una Apreciación Global”	Spanish	Juan Carlos Nishiyama y Carlos Eduardo Requena	www.u-sit.net
3. eBook “Heuristics for Solving Technical Problems – Theory, Derivation, Application” -- HSTP	English	Ed Sickafus (author)	www.u-sit.net
“Heurísticas para Resolver Problemas técnicos – Teoría Deducción Aplicación”	Spanish	Juan Carlos Nishiyama y Carlos Eduardo Requena	www.u-sit.net
4. U-SIT and Think Newsletter	English	Ed Sickafus (Editor)	www.u-sit.net
	Japanese	Toru Nakagawa and Hideaki Kosha	www.osaka-gu.ac.jp/php/nakagawa/TRIZ/
	Korean	Yong-Taek Park	www.ktriza.com .

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

To be creative, U-SIT and think.