U-SIT And Think News Letter - 63

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.

Updates and Commentary

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Dear Readers:

. With the mini-lecture in this newsletter I'm introducing the topic of the struggle we have between intuition and logic while adhering to the structure of structured problem solving. To demonstrate this effect I begin with the heuristic of working backwards. It is a well known heuristic in mathematics and we have all used it at least in solving some puzzles. It is one of the main heuristics of USIT.

3. Mini USIT Lecture – 63
5. Heuristics for Solving Technical Problems

The Intuition-Logic Struggle

Working backwards

We learn in the USIT textbook the importance of a well-defined problem and how to produce one from a wealth of problem-situation information. This is the topic of an early USIT lecture that is easily glossed over by students eager to get on with finding solutions. After all, "We've heard it before!" Yes, you have. Starting with a well-defined problem is a ploy of most structured problem-solving methodologies. But too often it is not recognized as a solution-finding step. How does that work?

How does defining a problem solve it? That's not quite what I mean. The point I want to make is that in the thought process of developing a well-defined USIT problem new insights are discovered. Each new insight instantly prompts the subconscious for intuitive solutions. We can't help that. In fact, we want to encourage it.

Intuitive solutions are often wrong, even so they provide excellent starting points for modification and polishing to make an unacceptable concept into an acceptable one. Of course you don't know a concept is wrong until you have consciously tested it. Then issues are discovered which seed again the subconscious. Intuitive solutions from our subconscious prime our conscious into rational thinking.

Recall that one of the solution techniques of USIT is to start with a known solution. This technique came about as an extension of the mathematics heuristic of working a problem backwards, from a solution to the initial problem. It is embodied in the particles method of ASIT and USIT, and the

little people of TRIZ. Another USIT heuristic, an extension of working backwards, is to look at intuitive solution concepts as tentative solutions to be modified for possible use.

Reality versus logic

In a moment we're going to do an exercise together to demonstrate a subconscious conflict of reality and logic. I could tell you this at the end of the exercise and then have you go back and review how it happened. However, it occurred to me that it might prove more effective to give you a clue of what to watch for as we proceed. Since it is a subconscious phenomenon, I don't think forewarning will affect the results.

The logic of USIT suggests first establishing an unwanted effect. Follow this with its analysis. Then look for solution concepts. The reality is that upon recognizing an unwanted effect one's mind immediately offers intuitive solutions. It is reminiscent of the axiom, "Put a problem on the table and everyone present will instantly try to solve it".

Intuitive solution concepts

To illustrate how quickly intuitive concepts come to mind I'll suggest a problem situation and slowly walk us through it. As you read, stop immediately (before you see my ideas) to write down solution concepts as they come to your mind, any intuitive ideas. These should include related problems and known products that come to mind. Of course you and I will have some of the same ideas and some different ones. There is more to be discovered in this exercise, but I'll save that until we have some ideas to work with.

{Pause here to get a pencil and paper. Heuristic: Learn by doing.}

The {Pause here: …} inserts that follow show where I paused to ponder a moment.

A simple way to find a problem to discuss is to pick an obvious artifact ,any manmade object, and wonder how it might be improved. This could involve modifying an existing feature (incremental improvement) or adding a new one (invention). I'm typing this lecture using a computer keyboard. This could be a useful artifact. Let's give it a try.

I asked myself if a keyboard could be improved? That led me to look at it to see which keys I use and don't use.

{Pause here: Have you written any ideas yet? If not, give yourself another 30 seconds while you stare at your keyboard.}

I noted immediately that I rarely use the numeric keypad, 20% of the length of my keyboard.

{Pause here: Any intuitive activity yet?}

Then I noted that I rarely use the F-keys, 40% of the width of my keyboard.

{Pause here: Now how many ideas have you gotten?}

Without pausing to verbalize an unwanted effect, several intuitive concepts came to my mind:

1. Make the numeric keypad thin and slide it in and out from under the main board when working on projects that need it.
2. Make the thin keypad a touch-sensitive pad.
3. Make the F-key row retractable also, to be brought out for projects that use them.
4. Replace the F-key row with a single-line display screen showing the line being typed. This would ease the distraction and avoid loss of time when stopping to find the cursor

on a large screen.
5. Make a folding keyboard to hide unneeded sections.
6. Design a split, rotatable keyboard (a known product).

Now that those ideas are out of my head I can move on.

{Pause here: Did you think of these ideas and/or others? Did these cause you to think of others? List any ideas that reading mine caused you to think of – ideas spawn ideas. Did some of your ideas spawn others?}

7. Have the numeric keypad and/or the F-keys appear in a corner of the main screen when needed. Display and operate them using the mouse.

Pause here: (I'm momentarily out of ideas.) Was your intuition productive up to this point? How many ideas did you have? Did it occur to you that any particular ones might be worth developing further?

Our goal in this exercise is to select a problem situation and develop it into a well-defined problem. The above pauses and moments of pondering were to clear our minds of intuitive ideas without filtering them.

An unwanted effect that is nagging in the back of my mind is the computer keyboard takes up too much desk space. I'll continue with that idea. You will get more out of this exercise if you choose your own unwanted effect to work on as you read.

Points of contact offer phenomenological insight

Next we need to select objects that contain the unwanted effect. Two pairs of contacting objects came to mind: keyboard and desk, and keyboard and fingers. It's convenient to group fingers as a single object. I'll look first at the keyboard-and-desk pair of objects and then consider keyboard-and-fingers. The former will clarify the functions a keyboard has; the latter will clarify its operation.

Serious analysis of a pair of objects and an unwanted effect begins at their point of contact. The phenomenology we invoke, to rationalize proposed causes and their effects, provides new insights.

Phenomenology

The frame defines the footprint of my keyboard. Within the frame are individual key assemblies. The keys are arranged into several function groups; a QWERTY group with its own numbers, the F-keys, a numeric keypad group, arrow keys, Insert and Delete and 4 page-selection keys, 3 screen manipulation keys, and an isolated Esc key.

{Pause: Any intuitive activity here?}

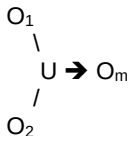
8. Replace F-keys with voice activation.
9. Replace screen manipulation keys with voice activation.
10. Replace the F-row of keys with a built-in touch-sensitive cylinder of keys. Rotate the cylinder to a row of F-keys or a row of screen manipulation keys, or arrow keys, as desired. Maintain cylinder position with angularly arranged detents.
11. Replace the top row of number keys with the key cylinder (10) and let the F-row be the default position of the cylinder.

Other objects to consider are fingers that make contact with keys.

Intuition model

It appears that subconsciously I'm using a simplified OAF model in finding intuitive

concepts – no attributes are involved. This demonstrates that intuition is seeded quickly with only objects and effects. By adding attributes to our thought path we begin to subdue intuition and emphasize logic. Logic, in this instance, gives us pause to rationalize the addition of other key features in problem definition. Once this is done, intuition will again become active, as you will see.



----- This lecture topic will be continued. -----

The next lecture will begin with construction of a plausible root-causes diagram. You might find it interesting to do this on your own before the next newsletter comes out.

7. Papers and essays

The following materials can be read by clicking on their titles. Links are also available on the USIT website (www.u-sit.net/Publications)

1. "Injecting Creative Thinking Into Product Flow"
2. "Problem Statement"
3. "Metaphorical Observations"

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 at www.ic.net)
2. USIT Resources Visit www.u-sit.net and click on Registration.

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/
	Korean	Yong-Taek Park	www.ktriza.com/www/usit/register_form.htm
"**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.
Mini-lectures from NL_01 through NL_62	Spanish	Juan Carlos Nishiyama y Carlos Eduardo Requena	www.u-sit.net click on Registration

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

To be creative, U-SIT and think.