Book Review: Unified Structured Inventive Thinking – an Overview

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Unified Structured Inventive Thinking -- an Overview by Ed Sickafus. 50 pages. Available free from www.u-sit.net in either PDF or doc format. © 2001.

The purpose of a book review is usually to tell the reader whether the book is worth the money—so what does a reviewer do when the book is free? For TRIZ Journal readers, we have focused on the question of whether the time spent reading ***Unified Structured Inventive Thinking -- an Overview*** will be worthwhile.

The reviewers were concerned that this free book was just an extended advertisement for Ed Sickafus' textbook and classes, in which case the TRIZ Journal would not give it the publicity of a book review. To our great satisfaction, this book stands on its own, and will be very helpful to people who want to learn USIT. It will also be helpful to those who use "full" TRIZ, who may have ignored the insights that the development of SIT and its derivatives can offer.

USIT is related to both TRIZ and to SIT, but differs in the emphasis on functions, attributes, and objects, and on the structure of the initial problem analysis. USIT was developed by Ed Sickafus, beginning in 1995, from his study of SIT, from his work at the Ford Motor Company, and his observation of how people in an industrial situation learn new systems.

TRIZ students and practioners who use functional analysis (whether subject-action-object method or problem formulator method) will find Sickafus' method very helpful, since it gives a structure to the analysis of the means by which the function operates, through the interaction of the attributes of the objects.

The object/attribute/function analysis can be expressed in a table or in a sentence. The template for the sentence is

> *Attribute* of **object-A** interacts with *attribute* of **object-B** to (function) change/maintain *attribute* of **object-(X)**.
>
> **Examples:**
>
> Writing on paper with a fountain pen has several points of contact. One involves the pen's split **nib** and the paper. *Pressure* of the **paper** interacts with *elasticity* of the **nib** to broaden the *gap* of the **nib** (allowing ink to flow).
>
> Operating a bicycle: The person exerts *force* on the **pedal**, which interacts with the *friction* between the **wheel** and the road to accelerate the **pedal**

(which causes the bicycle to accelerate—but USIT starts with only the objects that are touching being named in the analysis)

USIT has adopted the qualitative change diagram from SIT, which is a very simple graph that makes it obvious that a harmful effect must either be eliminated, or converted into a useful effect. This is a common TRIZ strategy as well, and the diagram makes it very easy to see the opportunities.

Overall, the flow and structure of the method is the definition of the problem (with a number of very explicit problem steps) followed by a choice of

- The closed world method—focuses on the situation as it was designed to work properly, and fixing what is wrong with the resources of the system
- The particles method—focuses on the situation as it should be, (Ideal Final Result, in TRIZ terms) and works backwards to how to achieve it.

Diagrammatic methods are shown in the abstract for each of the methods, but more examples would be very helpful to someone trying to learn the method from this book alone. Someone who already knows one of the related methods will have a somewhat easier time learning how USIT differs from ASIT or from TRIZ, but would still benefit from examples to learn to actually use the methods of USIT that are new.

The flow then converges on six methods for developing solutions, once the problem solver has used either the closed world or particles method to define the detailed nature of the solution required. This section has specific examples, with illustrations, which makes it much easier to understand than the more abstract sections.

There are six methods for solution, each with its own vocabulary:

- Uniqueness – spatial/temporal characteristics of functions,
- Dimensionality – activation/deactivation of attributes,
- Pluralization – multiplication/division of objects,
- Distribution – rearrangement of functions,
- Transduction – attribute-function-attribute links and
- Generification – solution templates from known solutions.

Some are directly derived from TRIZ, some from SIT, and some are hybrids that should be studied in the USIT context, rather than as they relate to other methods. Readers who know the other methods will benefit from the new techniques that Sickafus has added, and readers who do not know the other methods can start with these very easily.

To return to our opening question,

The purpose of a book review is usually to tell the reader whether the book is worth the money—so what does a reviewer do when the book is free? For TRIZ Journal readers, we have focused on the question of whether the time spent reading ***Unified Structured Inventive Thinking -- an Overview*** will be worthwhile.

People who use TRIZ only for non-technical (business process improvement, social problem, etc.) applications will probably find ***USIT-an Overview*** to be too abstract, since there are no examples of discussion of non-physical situations. But all other TRIZ and SIT practioners, teachers and students will find helpful insights that are immediately useful.