USIT: Teaching Inventiveness

Unified Structured Inventive Thinking
Ed Sickafus
Ntelleck, Grosse Ile, Michigan
(http://ic.net/~ntelleck)
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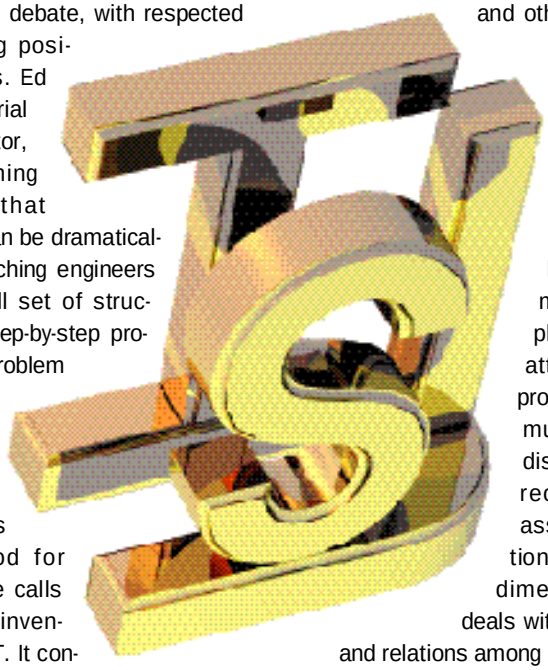
Whether inventing is a teachable skill or an unchangeable inborn talent remains an ongoing debate, with respected researchers taking positions on both sides. Ed Sickafus, an industrial physicist and inventor, opts for the teaching side. He argues that inventive thinking can be dramatically enhanced by teaching engineers a surprisingly small set of structured heuristics—step-by-step procedures to guide problem solving—to generate conceptual solutions to conceptual problems. His book describes a thinking method for inventors, which he calls unified structured inventive thinking, or USIT. It consists of heuristics that are organized in an algorithmic procedure.



USIT is based on the author's extension and refinement of structured inventive thinking, or SIT (see ***The Industrial Physicist***, 3/96, pp. 18–20), a method for inventive problem solving developed at the Open University in Israel. SIT, in turn, aimed to simplify and improve Genrikh (Henry) Altshuller's problem-solving approach called TRIZ (see ***The Industrial Physicist***, 9/96, pp. 14–15). The transition from TRIZ to SIT reduced the number of heuristics from a few dozen to five. The transition from SIT to USIT was motivated by Sickafus's experience in teaching SIT to Ford Motor Co. engineers and scientists and in leading a team that applied the methodology daily. The main difference between SIT and USIT is that USIT places less emphasis on truly creative solutions and more on a thorough and quick exploration of possible solutions—known and unknown—to find many solution concepts.

One of the author's important contributions to structured problem solving is the division of the problem content into three entities: objects, attributes (shape, size, etc.), and functions (the change in one object's attributes as the result of its interaction with another). All the rules, heuristics, and other aspects of the USIT method are expressed in terms of these three entities and the relations among them. Accordingly, USIT has three main heuristics: pluralization, which attempts to solve a problem by dividing or multiplying objects; distribution, used to reorganize the assignment of functions to objects; and dimensionality, which deals with changing values and relations among attributes.

The book is written in a clear and rigorous style. It explains the USIT method in a way that enables readers to apply the method themselves. Many easy-to-follow illustrated examples take the reader step-by-step through the process. In the last chapter, Sickafus describes his experiences in leading the effort to teach SIT and USIT at Ford and to apply the methodologies in an organized manner to the solution of corporate problems. It is too early to judge conclusively how effective the SIT program is at Ford. However, to my knowledge this initiative is the most ambitious attempt to introduce, on such a large scale, an inventive thinking methodology into an organization. Ω

BIOGRAPHY

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