

THE THEORY OF INVENTIVE PROBLEM SOLVING

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A modern engineer should have a fairly serious set of system competencies. Today, in the qualification of an engineer, knowledge and skills in ensuring the relations of production with the market are valued, in the future such a specialist will be helpless without knowledge of the methods of analysis and forecasting of the situation that become the most important component of the training of an engineer of the 21st century. TRIZ provides a tool to help you successfully cope with both practical and theoretical problems from the most diverse areas of human knowledge. TRIZ is not only a tool that allows an engineer, inventor to predict a problem situation and purposefully search for an optimal solution to a problem, it is also a tool for subtle, bold, highly organized mental operations.

The theory of inventive problem solving, (TRIZ), is a set of methods for solving technical problems and improving technical systems. TRIZ is a science that allows not only to identify and solve creative problems in any field of knowledge, but also to develop creative (inventive) thinking, to develop the qualities of a creative person. TRIZ is a unique tool for: search for non-trivial ideas; identifying and solving many creative problems; selection of promising areas for the development of equipment, technology and cost reduction for their development and production; development of creative thinking; the formation of a creative personality and teams.

TRIZ methods. In the process of solving TRIZ problems, several approaches are used at once: brainstorming method; synectics (comparison and finding similarities in objects and phenomena); morphological analysis (identification of all possible solutions); the method of focal objects (establishing associative relations with various objects).

TRIZ has two goals: 1) training a new technology for solving inventive problems; 2) the education of the qualities inherent in a creative person. The goal of TRIZ is the development of flexible thinking and imagination, the ability to solve complex problems in elegant and effective ways. Psychologists have made great efforts to analyze the quality that is called the need for creativity or ingenuity. It is believed that the ability to invent, in turn, depends on: heredity; environment; previously obtained overall development; level of scientific and technical training. Psychologists conducted a variety of studies in order to determine the most characteristic features of the inventors. As a result, the following patterns were established: 1. The ability to boldly choose a Worthy Goal (even if it is considered completely unrealistic) and make it the main vector of your life; 2. The ability to see problems whose solution is necessary and sufficient to achieve a Worthy Goal; 3. The presence of a set of real work plans. Availability of a package of work plans for a month, for a year, for a lifetime. Regular monitoring of the implementation of these plans; 4. High performance. (in the implementation of plans); 5. A good technique for solving creative problems that are part of the problem; 6. The ability in all circumstances to uphold one's ideas and developments; ability to "hold a punch".

To educate these qualities is much more difficult than to teach creative solutions. TRIZ is a tactic of creativity. Nurturing a set of six qualities is an operational art. We also need a creative strategy for life. If we want to learn TRIZ well, if we want to get maximum results from training, we need to cultivate a set of creative qualities. If we want to conduct it effectively - must in turn be based on a life-long creative strategy.

Keywords: *TRIZ, technical problems, creative thinking, creative person.*

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