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THEORY OF INVENTIVE PROBLEM SOLVING IN MANAGEMENT

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TRIZ - Theory of Inventive Problem Solving - an area of knowledge, exploring the mechanisms of development of technical systems in order to create practical methods for solving inventive problems.

TRIZ development was caused by the need to accelerate the inventive process, eliminating such elements of chance as a sudden and unpredictable insight, blind search for options, depending on mood and others. In addition, the aim is to improve the quality of TRIZ and an increase in the level of inventions by using different methods of removing psychological inertia and enhancing creative imagination.

The main tool of TRIZ was originally a solution algorithm of inventive problem solving (ARIZ). ARIZ is a series of consecutive logical steps, which aim to identify and resolve the contradictions that exist in the technical system and hinder its improvement. In the process of ARIZ development it had a number of modifications.

TRIZ opportunities are based on the following :

1) Clear definition of a problem structure, its simplification to the form of binary contradictions (or several contradictions) thus providing the correct diagnosis of the problem and identifying its real essence;

2) Determination of the interacting elements of a problem situation and the resources necessary and sufficient to solve the problem, thus evaluating the real forces " enemies " and " allies " ;

3) Nomination of ideal goals, mental ideal modeling of necessary functions required for future solutions, thereby stimulating the departure from the usual stereotypical decisions impact;

4) Use of experience in creating hundreds of thousands of inventions to find effective solutions to urgent problem. TRIZ gives examples of such solutions and illustrates their examples ;

5) Application of TRIZ laws of systems development for the strategic selection of the direction of the search of ideas solutions ;

6) Application of strict disciplining techniques of a problem step by step analysis and an idea solution synthesis in the form of so-called algorithms of Inventive Problem Solving (ARIZ).

Solving problems is an everyday task of a manager. The future of the staff, the department, the whole organization depends on the right decision making. But how to anticipate all possible consequences of decisions? You can apply ARIZ in order to see and analyze positive and negative aspects.

The structure of real decision-making processes is mainly determined by the situation and the problem being solved.

Let's consider the content of the basic procedures of decision-making process, which correspond to the parts of the algorithm of inventive problem solving.

• **Situation Analysis.** The analysis of a management situation requires collection and processing of information. This step serves as a function of organization perception of external and internal environment. The data on the major environmental factors and the state of affairs in organizations comes to managers and professionals who analyze it and compare actual values of monitored parameters with planned or predicted, which allows them to identify problems to be solved.

• **Problem Identification.** The first step towards solving a problem is its definition or complete and correct diagnosis. As they say, to formulate the problem correctly means to solve it already halfway.

The problem identification and formulation is considered to be a rather complicated procedure. The fact is that many important problems are poorly structured at the time of their inception, they contain no obvious targets and alternative ways of their achievement, no facts about the costs and effects associated with each option. Managers have to possess not only knowledge and experience, but also talent, intuition and creativity to bring these problems to quantitative determination (structuring).

Do not forget that all elements and work in the organization are interrelated and solving a problem in one part of the organization can cause new problems in the other. Therefore, while defining problems being solved managers should strive to ensure that the number of newly arising problems could be minimal.

• **Selection criteria defining.** Before considering possible solutions to problems, it is necessary for a manager to identify indicators that will be used for comparison of alternatives and selection of the best one. These indicators are called selection criteria.

• **Alternatives development.** The next step is the development of a set of alternative solutions to the problem. Ideally, it is desirable to identify all possible ones to make the solution optimal. Managers are well aware that the search for the optimal solution is very difficult, time consuming and expensive, so they do not search for the best one, but accept a good viable option that allows removing the problem and help cut unsuitable alternative selection criteria defined in the previous step.

• **Alternative selection.** After possible problem solutions are developed, they need to be assessed comparing all their advantages and disadvantages as well as objectively analyzing possible results of their implementation. Selection criteria for comparison were set in step 3.

• **Decision coordination.** The best way to coordinate decision is to attract workers to the process of its making. Of course, this method does not need to be the only one. There can occur situations when it is not possible rational and the manager is forced to make decisions alone.

• **Implementation management.** The problem-solving process does not end with the alternative selection. To get a real effect all decisions should be implemented. It is the main objective of this step.

• **Monitoring and evaluation of results.** Even after the final decision is put into effect, the decision making process cannot be considered fully completed, as it must be also verified whether it justifies itself. It is the control step performing the function of feedback that serves to this purpose. At this stage the assessment of all measures and the consequences of the decision-making process and the comparison of actual results with the intended ones is carried out.

The application of the theory of inventive problem solving in management today is not wide-spread. On the other hand it is worth noting that this approach to managerial decision-making is rather simple, convenient and effective.

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