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APPLICATION OF TRIZ METHOD IN LIFE QUALITY

Abstract : TRIZ is an inventive thinking and problem solving process. With each passing day, inventive minds becomes dominant in every area. TRIZ has been successfully applied in the engineering and management fields through innovative thinking, through the setup of contradiction matrix and through systematic solving of specific problem. If you know that inventors create new things, then it makes sense that the word inventive applies to people and behavior that show creativity. This interaction changes our life quality. The positive change of our quality of life means that we have a happier future. For this reason there are the benefits of implementing methods that are known to be successful in an application. TRIZ is among the successful methods in the method. This presentation will review just a few of these principles of TRIZ and show how they are used in real problem solving situations of life quality.

Key Words: TRIZ, method, life, quality

1. INTRODUCTION

Quality of life is a widely used concept. It is used by common people as well as by governments and local and international organizations. It usually refers to a life which is considered as a good one, well-lived, and being of value. It may also refer to the presence of those conditions that favor such a good life.

Quality of life is also a globally accepted aspiration. People are expected to undertake actions that enhance the quality of their lives; there is little debate about their right to do so, since it is widely presumed –even as a self-evident truth- that the pursuit of a life of quality is an unalienable right. It is also expected from governments as well as from local and international organizations to hold the enhancement of people's quality of life as a top priority and a main justification for their actions.

Being an umbrella concept, quality of life is difficult to define. Most efforts have concentrated in measuring quality of life rather than in discussing its conception.

This is another case in which rather than discussing what a concept means, researchers hope for its measurement to suffice in providing

a definition. In consequence, the concept ends up being defined by how it is measured, and the debate –and most efforts- focus on such measurement problems as availability of variables, construction and properties of indices, definition of weights, and use of dimension-reduction techniques, rather than on what quality of life is

Other ways ,TRIZ has become an umbrella that covers a family of inventive concepts, tools and processes that have been used repeatedly to solve difficult problems and provide a general approach for inventive problem solving. TRIZ encourages a different level of thinking. Executives want people and teams who can think outside-the-box. TRIZ promotes a set of principles and questions that help people do just that.

2. PROBLEMS

Until now, engineers' main role is to solve given problems and engineering education also emphasize problem solving ability. Therefore they usually try to use easily perceived solution instead of trying to analyze the given problem and defining real problem, and go through lots of trial and error. But, these days the

importance of speed is emphasized in the knowledge-based society and the repetition of trial and error cannot be beautified as endurance or effort any more. Especially companies must be very cautious about it. So, engineers require the ability to define real problem accurately before trying to solve problem.

There are two groups of problems people face: those with generally known solutions and those with unknown solutions. Those with known solutions can usually be solved by information found in books, technical journals, or with subject matter experts. Here, the particular problem is elevated to a standard problem of a similar or analogous nature. A standard solution is known and from that standard solution comes a particular solution to the problem.

The other type of problem is one with no known solution. It is called an inventive problem and may contain contradictory requirements. As long ago as the 4th century, an Egyptian scientist named Papp suggested there should be a science called heuristics to solve inventive problems. In modern times, inventive problem solving has fallen into the field of psychology where the links between the brain and insight and innovation are studied.

Methods such as brainstorming and trial-and-error are commonly suggested. Depending on the complexity of the problem, the number of trials will vary. If the solution lies within one's experience or field, such as mechanical engineering, than the number of trials will be fewer. If the solution is not forthcoming, then the inventor must look beyond his experience and knowledge to new fields such as chemistry or electronics.

Then the number of trials will grow large depending on how well the inventor can master psychological tools like brainstorming, intuition, and creativity. A further problem is that psychological tools like experience and intuition are difficult to transfer to other people in the organization. This leads to what is called psychological inertia, where the solutions being considered are within one's own experience and do not look at alternative technologies to develop new concepts

When we overlay the limiting effects of psychological inertia on a solution map covering broad scientific and technological disciplines, we find that the ideal solution may lie outside the inventor's field of expertise. If problem solving was a random process, then we

would expect solutions to occur randomly across the solution space. Psychological inertia defeats randomness and leads to looking only where there is personal experience.

3. TRIZ?

TRIZ is a problem solving methodology based on logic, data and research, not intuition. It draws on the past knowledge and ingenuity of many thousands of engineers to accelerate the project team's ability to solve problems creatively. As such, TRIZ brings repeatability, predictability, and reliability to the problem-solving process with its structured and algorithmic approach.

TRIZ is the prefix of Theory of Inventive Problem Solving in Russian. The founder Genrich. S. Altershuller defined the inventive problems as problems which contain at least one contradiction. He maintained that the contradiction means the improvement of one characteristic will lead to the decline of the other characteristic in the system.

When we critically reflect on how we solve problems, researchers suggest we should ask four questions:

- How do we identify and define a problem?
- 2.How do we mentally represent the problem?
- How do we plan to proceed?
- How do we evaluate our problem solving performance?

Each question stimulate our metacognitive thinking—that is, our thinking about how we think.

Many of the familiar quality methods provide useful frameworks for identifying and defining a problem. Control charts, for example, identify and define a problem in terms of sources of variation. When I have brainstorm meeting for the problem-solving, I always think, maybe some other people in other departments or other companies had similar problems, and they had brainstorming meeting.. and found their own solution...

Altershuller refined 39 prominent parameters which will lead to the system conflict and 40 pieces of inventive principles resolving the conflict by analyzing more than 1.5 million pieces of patents for invention. To arrive at improvement, TRIZ uses 5 basic

principles and 40 inventive principles. TRIZ forces us to look at problems differently.

1. The ideal end result

Thinking out of the box is a good principle to achieve an ideal end result. TRIZ encourages people not to be satisfied too quickly with the solutions to a problem, but to be always open to even better ideas.

2. Less is more

There is not always a need to invest a lot of money to arrive at the best idea. Innovation can be realized with existing materials and sometimes the solution is close at hand.

3. Solutions already exist

TRIZ helps people define problems in terms of frequently used and general principles, which enables searching for solutions outside their primary field of expertise.

4. Search for fundamental contradictions

Innovating equals problem solving, which mostly exist of contradictions. When these contradictions are defined, the solution is often imminent.

5. Lines of evolution

Systems do not evolve randomly. There are fixed patterns that make the evolution of technology predictable,

The 40 Principles are a list of ideas—such as segmentation, asymmetry and universality—that provide another perspective for looking at a problem. Ideality is the ratio of a system's useful to harmful functions, and is used to describe the ideal solution. Resources means using things already available in the system to solve the problem. What's more, he developed the 39th-order conflict matrix to solve the inventive problems. In the conflict matrix, the row represents the characteristics requiring improvements, whereas the column represents the aggravated characteristics. The intersection between each row and column is filled by serial numbers which stand for recommended inventive principles. It is defined that each intersection contains a maximum of 4 principles. However, these principles can not solve the problems directly, they can only provide the most possible direction of solutions.

When solving the practical problems, we should put forward the specific solutions by combining the objective conditions with the principles. TRIZ includes a series of logic methods such as Inventive Principles, Algorithm for Inventive Problem Solving and Standard Techniques. The general principle of the application of TRIZ is that it firstly transforms the common problems into TRIZ problems, and then takes an advantage of tools such as Inventive Principles, Standard Techniques to find the analogous solutions

4. CONCLUSION

There are many principles related to creativity development, one out of it is that "creativity is augmented by creative thinking tools". In other words, the creative thinking tools play an important role in filling up the gap between major knowledge and creativity. So, we need to utilize creative thinking tools as such brainstorming, mind map, triz, and so on in education. Especially TRIZ, also known as the Theory of Inventive Problem Solving, provides very effective tools for exploding our psychological inertia that we usually try to solve perceived problems intuitively and empirically. Internally and externally many industries have produced remarkable performance with TRIZ in practical business.

TRIZ used in combination with other techniques during project life cycle and leads them to be adaptive for the specific situations – by modelling the actual techniques with TRIZ. The key in development is creativity, but not only, and this is the point where TRIZ makes sense to be applied. TRIZ makes problems and contradictions to be understandable and open new approaches of how to solve the issues. This study has proposed a new innovative approach based on TRIZ methodology and LIFE QUALITY. The aim of proposed approach is to solve problems and to improve the quality of life quality. We combined TRIZ methodology and LIFE QUALITY. In addition to this, TRIZ is also very useful to solve problems innovatively. Therefore, we mapped the determinants of LIFE QUALITY with the analogical explanations of the 39 TRIZ engineering parameters.

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