

## TRIZ (THEORY OF SOLVING INVENTIVE PROBLEMS) IN HUMAN CAPITAL MANAGEMENT

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### **ABSTRACT**

*Globalization is today's key term and it forces companies to worldwide competition. In order to build and sustain their competitive advantage, the knowledge becomes a critical strategic resource and this perspective brings staffs to the organization's heart. Managing Human Resource is today's most challenging problem. Numerous studies have identified the elements of human resource practices and organizational performance. Purpose of this study is to create an inventive guide for today's human resource professionals with TRIZ methodology. TRIZ is a problem solving, analysis and forecasting toolkit which is first used in technology and engineering. But recently, within last few years, several TRIZ experts started to extend application of TRIZ techniques to business and management problems and tasks. The guide will provide a useful methodology to solve intangible problems in human capital issues.*

**Keywords:** TRIZ, Human Capital Management, Problem Solving in Human Capital

### **1. INTRODUCTION**

In our changing world, there is an increasing global competition and a shift to knowledge based work enabling information technology, and other related factors. This changing has led Human resource management shift from "personnel management" to part of a strategic management. In recent years, HRM was employing people, developing their resources, utilizing, maintaining and compensating their services in tune with the job and organizational requirement, but today's world these are only basic responsibilities of Human Resource Managers. In this context; companies have to face several kinds of Human Resource Management problems. To identify HRM problems, 19 key concepts have chosen as contradiction parameters. These are; employee satisfaction, employee motivation, human capital, management leadership, knowledge sharing, employee commitment, value alignment, structural capital, process execution, knowledge integration, training, retention of key people, relational capital, knowledge generation, business performance, skills and competences, atrategy execution, innovation capability, culture and values. [1]

### **2. TRIZ & MANAGEMENT-TRIZ**

Genrikh Saulovich Altshuller (1926-1998) developed the "Teorija Reschenija Izobretatel'skich Zadac" that he then called TRIZ (Theory of Solving Inventive Problems in english) in 1950. TRIZ is a problem solving, analysis and forecasting toolkit derived from the study of the global patent literature. Its basis is the study of patterns of invention in the global patent literature. He reasoned that the way to improve the quality and pace of innovation was to study the patent literature where inventions are documented [2]. This is how he outlined new possibilities to learn inventive creativity and its practical application. In 1945 he observed that patent applications were ineffective and weak. He also quickly

recognized that bad solutions to problems ignored the key properties of problems that arose in the relevant systems [3].

During his study, Altshuller found that more than 90% of the engineering problems had been solved before: the same fundamental problems (or Contradictions) in one area had been addressed by many inventions in other technological areas and the same fundamental solutions had been used over and over again. Based on the analysis of 40,000 patents, which Altshuller abstracted to 40 Inventive Principles, he then constructed the Contradiction Table to resolve over 1200 Contradictions between pairs of 39 standard engineering parameters [4].

Companies have to face several kinds of management problems. Management problems arise from all organizing activities such as planning, controlling, and organization, as well as personal aspects such as leadership. In this context the ‘Theory of Inventive Problem Solving’ becomes more popular, because many problems cannot be solved by known solving methods or techniques. Several experts feel confident about the application of TRIZ to management problems. The transfer of TRIZ to the field of management is referred to as ‘Management-TRIZ’ [5]. If TRIZ is rather well known and used in technology and engineering, applications of TRIZ in business and management areas have been practically unknown. This should not be surprising: TRIZ was created by engineers for engineers. But recently, within last few years, several TRIZ experts started to extend application of TRIZ techniques to business and management problems and tasks. Results appeared to be more than encouraging: seemingly unsolvable business and management problems were solved very fast. Souchkoc indicated that, still today, the majority of TRIZ professionals work in the area of technology rather than business, this is their comfort zone. In addition, many TRIZ experts working in the technology areas are vaguely familiar with specifics of business environments; therefore direct applications of “technological” TRIZ are not always successful. TRIZ for Business and Management was needed [6].

While the Matrix for Technology and Engineering was originally developed by Altshuller in the 1960s, a Contradiction Matrix for TRIZ in Business and Management was developed by Darrell Mann and introduced in [Mann D. & Domb E., “40 Inventive (Management) Principles With Examples”, The Online TRIZ Journal, September, 1999.& Mann D., Hands-on Systematic Innovation for Business and Management, Lazarus Press, 2004.].

Souchkov mentioned that after identifying the contradictions the next step is to solve them. The most popular technique for a majority of problems is a collection of 40 Inventive Principles and so-called “Contradiction Matrix” which provides a systematic access to the most relevant subset of Inventive Principles depending on a type of a contradiction. He pointed out that although 40 Inventive Principles look similar for both Technology and Business applications, the matrices are different [6].

### **3. RESEARCH**

The first basic idea was to apply TRIZ tools to engineering problems but in the last few years, Inventive Principles and the Contradiction Matrix of TRIZ started to be studied in several non-technical areas like business, finance etc. This study aims to analyse how the 40 Inventive Principles can be applied to human resource management. Domb and Mann’s (1999) study of TRIZ in Business subjects has followed to better organize the research in Human resource management [7].

### **4. CONCLUSION AND FURTHER RESEARCH**

There are thousands of human resources/capital management texts published every year. Managers don’t have time to search these resources to develop their system. TRIZ is an inventive tool to design a guide for managers. While designing this matrix culture of the organization should be taken into consideration. It would be more convenient if three different matrix designed for each culture (focus); operational excellence, product (service) leadership, customer intimacy [8].

## 40 Inventive HR Principles

1	SEGMENTATION	Cost Analyses Training Analyses Empowerment Work Design	21	SKIP	Free flow of information Innovation culture Knowledge creation Suggestion system Freedom of expression
2	TAKING AWAY (Extraction)	Advancement opportunities.(Compensation, Promotion, Job enrichment)	22	TURN THE HARM TO ONE'S GOOD	Free flow of information Encouraging to freedom of expression Suggestion system Competition for new ideas
3	LOCAL QUALITY	Work Design (Change work hours, Change administrative rules, Performance appraisals) Promotion developing Working environment Outsourcing Hire Consultant	23	FEEDBACK	Knowledge sharing Advanced User friendly Network Information system Open Door Policy Communication Channels Social Activities
4	ASSYMETRY	360° Appraisals Strategic Management Open Door Policy Improve Communication channels	24	INTERMEDIARY	Hire Consultant
5	COMBINING	Improve communication channels White Collar / Blue Collar Compensation equivalency Develop more social activities Cultural Integration	25	SELF-SERVICE	Performance center Self evaluation system design Employee involvement
6	UNIVERSALITY	Team building Team leadership Training Analyses Outdoor training Managing diversity	26	USE OF COPIES	Outsourcing Cost analyses for reduction 6 Sigma Employee satisfaction surveys
7	NESTING	Career maps Investment to employee Maslow's Hierarchy of Satisfaction	27	CHEAP SHORT-LINES INSTEAD OF COSTLY LONG-LIFE	Hire project-base employee Hire part time employee
8	COUNTERWEIGHT	Mergers Hire Consultant Change recruitment system	28	MECHANICAL PRINCIPLES REPLACEMENTS	Differentiation in HR functions Differentiation in Recruitment interview Differentiation in wage system (incentive payment etc)
9	PRIOR COUNTERACTION	Work Design Working hours Social Activities Prior to a lay-off, prepare compensation, outplacement, and communication packages for all affected employees	29	PNEUMATIC AND HYDRAULIC STRUCTURES	Flexible organization structure Flexibility describes changes in the size of the workforce, depending on short-term changes in market conditions Flexible management climate
10	PRIOR ACTION	Psychological counseling Mobbing training Improve communication channels	30	FLEXIBLE SHELLS AND THIN FILMS	Changing physical work conditions Delegate and leave people as free as possible
11	EARLY CUSHIONING	Recruitment	31	POROUS MATERIALS	Flat organizations Remove communication barriers between Hierarchy
12	EQUIPOTENTIALITY	Leadership training Career Management Rotation	32	CHANGING COLOR	Change Physically work environment social activity Increase social responsibility projects
13	OTHERWAY ROUND	Rotation Change HR Rules Change Recruitment system Change Performans Appraisal system Apply BPR in HR	33	HOMOGENEITY	Network organization T group training
14	SPHERICALITY	Change work design Change Organizational chart Rotate leadership of a team	34	REJECT AND REGENERATION OF PARTS	Hire Consultant Project based working
15	DYNAMICITY	Empowerment Technique Training Leadership training Team training Project training process management flexible organization structure	35	CHANGE OF PHYSICAL AND CHEMICAL PARAMETERS	Change performance criteria Change recruitment criteria Change wage system Change promotion system
16	PARTIAL OR EXCESSIVE ACTION	Continuous improvement (Kaizen) Continuous training 360 Appraisals	36	PHASE TRANSITIONS	Relational Capital
17	ANOTHER DIMENSIONS.	Authority by a manager to subordinate Changing organizational hierarchy	37	THERMAL EXPANSION	Structural Capital
18	MECHANICAL VIBRATIONS	Continuous Audit System Continuous HC Metrics analyses Continuous HR scorecard	38	STRONG OXIDIZERS	Change the firm's strategic focus Recruitment of different cultures Merging Strategic partnership
19	PERIODIC ACTION	Periodically Audit System Periodically appraisals Periodically HR metrics	39	INERT ATMOSPHERE	Strengthen Hierarchy Apply rules effective Strengthened The controls
20	USEFUL ACTION CONTINUITY	Kaizen Lean HR Continuous Improvement	40	COMPOSITES	Multi-disciplinary project teams. Employ different personality types Decrease Hierarchy

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