



# Creativity and Innovation as a New Approach in Human Capital

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## Abstract

This question has always been put forward in the mind of curious people why some countries have developed in spite of very few natural resources and facilities while other countries have not developed in spite of having more suitable resources and facilities. Various factors such as economy, culture, geography, etc. are perhaps a background to answer this question, but there is a more important factor that, in similar conditions, causes the development of some countries and that factor is to consider human resource as a fundamental capital and how to use their abilities and talents. The phenomenon of creativity and innovation, like many peculiarities of human beings, are found in all mankind and it is these motivations and individual and environmental conditions that make the creativity factor vivid. Among the features of intelligent organizations are: systemic thought, easy accessibility to information and so on all of which have originated from the well-beginners of creative and innovative people. This article deals with innovation and creativity, as the most important Human capitals, the relationship of brain and creative thinking, powers comprising mind capabilities, divergent and convergent thinking and the factors making innovations and creativity. The findings of this research indicate that with respect to increasing change and transformations of today's societies, the organizational thinkers in the 21<sup>st</sup> century are different from the thinkers in the 20<sup>th</sup> century. Critical thinking following creative thinking has created a new approach in the human capital of organizations. Therefore, the organizations that have employed this approach are successful.

**Keywords:**

*Creativity, Innovation, Thinking, Human capital, Creativity and innovative Organizations, Innovative models*

## INTRODUCTION

Human resource has played an important role in the evolution development of social structures of organizations during human history. The main changes in human history so far include agricultural revolution (10,000 BC) and industrial revolution (1700 AD) (Figure 1).

In the present age, which is differently labeled as ultra-industrial or information Society and/or Communication age, wave revolution, informatics revolution and Knowledge age, the speed of change and transformations is in a manner that has been known as the wonders of speed and transformations (Qane' Basiri, 1994).

In such a space, contemplation and thinking are the factors of distinction – some authorities believe that in an information society, three revolutions have happened and are evolving (Ahmadpoor, 2011):

- 1- Digital Revolution
- 2- Internet Revolution
- 3- Entrepreneurship Revolution

The foundation of the above-mentioned three revolutions had been new thoughts and ideas.

In the beginning of the twenty first century, the generation of human being has reached a new dilemma the similar of which has not been found during the history. The collapse of space, time and borders might have led to the creation of the global world, but not all of the people are its citizens. Although the professional of the world face light colored borders, but billions of other people still face strict borders as in the past (UNDP, 1999). It is quite clear that the nations that do not inherit experienced human resource and technological infrastructures structure are not able to create knowledge – based industries and consequently cannot participate

in the knowledge-based economy of the world (Rabi, 2005). It is natural that in any era in the history, societies have a basic role in special strata and classes. Regarding industrial societies, this role has been in the hands of capitalists and technologists.

Regarding the information society, the main role is on the shoulder of the trained people of society. At the present time, changes and transformations, because of the importance of environmental approach and the tendency of customers, are taking place so quickly and hastily that they have forced today's organizations to guarantee their survival through the supply of innovative services and products having developed technology. This issue involves creativity and innovation as a new approach in human capital.

In this article, it has been dealt with why some countries have developed in spite of very few natural resources and various natural limitations and the majority of other countries are underdeveloped in spite of having more suitable resources and facilities. Creative and innovative human capital is considered as one of the main resources that has a key role in the development of societies. In addition, the features of creative and innovative people, thought type and the backgrounds of its creation have been investigated.

### The concepts of creativity and innovation

The words creativity and innovations are often used interchangeably while they are different from each other.

Creativity is the creation of new ideas that are useful and applied; while, innovation is the result of Creativity and the effective use of the ideas that emphasize more on production and

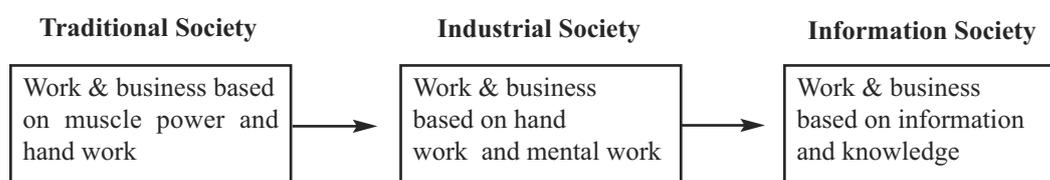


Figure 1: Process of Human Societies Evolution

Power Source: Muscle    Power Source: Material & Energy    PowerSource: Knowledgey

services. In fact, innovation is the main quality of entrepreneurship and creativity is counted as the main nucleus of entrepreneurial activities (Pardakhtchi and Shafi'zade, 2007).

Kourilsky (1980) believes that creativity is the tendency for finding different solutions, the ways of problem solving and also showing flexibility and divergent thinking. Innovation is the creation of methods, market products and / or new organization.

Kao (1995) has defined creativity as the process of a new work and innovation as the process of a different work.

Prochaska (2002), on the difference between creativity and innovation, believes that creativity is considered as an innovative process; that is, a new order to solve known problems. Innovation is the process of implementation; that is, the recognition of existing resources through knowledge and changing them into usefulness and value for the customer.

Creativity is an individual ability that can lead to invention or a fresh idea of a creative person (Saiedikia, 2007).

Innovation emphasizes on concepts such as usefulness, novelty, product creativity, processes and becoming commercial (Khairuzzaman and Abdmajid, 2007). In principle, the concept of innovation from the viewpoint of management is a process beginning from imagination and ending with the commercial delivery of a new product or service (Figure 2).

In this process, first, a person has permission to release his imagination (an imagination that is more important than knowledge from Einstein's view) and to move in different directions; then his imagination is changed into an idea; after that his idea is changed into a practical, useful and appropriate idea (creativity); consequently, he changes the practical ideas into goods, services, (Innovation); and ultimately the process of innovation comes to an end through the com-

mercial delivery of newly produced goods and services (Samad Aqayi, 1999).

Innovation is the same as invention, excitement, giving spirit, creativity (Chun, 2007).

Therefore, noticing the mentioned concepts, creativity and innovation meaning the creation of a new and the technical phenomenon include the aspect of their implementation.

### Thinking and creativity

In Weisberg's opinion, creativity is formed when a person uses a new solution to solve a problem which he faces. This view includes two important points; first, solving the problem and second, the novelty of the solution for the person solving the problem (Hoseini, 2001).

Creativity requires the various factors of interpersonal and interspersions.

Appropriate environment, aware parents, qualified tutors, instructional programs, individual differences, and diligence are among the requirements of creativity (Tasbihsazan, 2001). The power of thinking, in the literature of great scientists such as MollaSadra and Ave Cina, has been interpreted as a mental, spiritual, intellectual and divine power in a manner that continues its movement when it is connected with other conceptual powers.

Thinking means our own very important when we send it out from the elaborate form. Our thinking does not remain as a single and elaborate process but it is divided into parts and accordingly thought concepts are achieved.

When a person thinks, thus, a process is performed that separates a group of elaborate concepts (a descending movement from unity to multiplicity) and, after this separation, unites them (multiplicities) again through relations (unity). For example, when you think about water, you consider its being liquid, fluid, flowing, colorless, odorless and many other features of water separately and, in fact, separate



Figure 2: innovation process

them all from one another and bring them together and express that water is a flowing and fluid liquid that does not have color, odor, etc (Farhangi and Safarzade, 2007).

But, virtually, what powers do human beings have that thought is formed in this sense? There are five apparent senses in the human being that receive stimulus, things and outer phenomena, but this is only one side of the coin because receiving a stimulus and other things is one part of the work. Therefore, there is a mental sense of human being that completes the other party and that itself is composed of four powers (Durooschi and Shelkrasy, 1990).

- 1- Imagination
- 2- Thought
- 3- Memory
- 4- Comprehension

Our thought does not have limitation either and if we pass through wisdom and recognition, since human thought has an imaginative bridge, thus one cannot assign any border for it; and every one can think in any way, of course, its result can be ideal, melancholic and / or realistic. Therefore, it is better to draw a framework for it and to give it certain principles and standards.

A thought making, directional and framed viewpoint is so that it passes through the layers of spirit. Logic, among others, is a science that teaches us the way of correct thinking and, hence, we can reach new thoughts; and, certainly our most important searching must be through the use of this correct way of thinking. On the other hand, the correct thought having direction is strengthening the power of wisdom; and strengthening the power of wisdom causes increase in awareness; and increase in awareness causes the correctness of action, behavior and deed.

Tom Davies (1961), the most important features related to the creative thinking intended by Williams and Stern bragg (1991) who consider creativity as the whole thinking composed of the three types of synthetic thinking, analytical thinking and practical thinking which are as follows (Sadeqi and Amiri, 2007):

- 1- Fluency
- 2- Originality
- 3- Evaluation
- 4- Flexibility
- 5- Elaboration
- 6- Analytic
- 7- Intuition
- 8- Logical thinking

Amabile (1989) holds that if a person enjoys the highest level of technical skill without creative thinking, he will never be able to present a creative work.

To Amabile, some of the features of creative thinking that are inquisitional and can be instructed and promoted are together with the following thought values.

- 1- Breaking habits
- 2- Delaying judgment
- 3- Understanding and comprehending complexity
- 4- Global thinking

Amabile also mentions the aspects of creative thinking like work style life that are acquired and promoted through instruction and experience:

- 1- Undertaking to perform activities well.
- 2- Prolonged concentration on a problem.
- 3- Ability to give up old ideas and thoughts.
- 4- Love and interest challenge with problems.
- 5- Deep interest in working hard

### **Mind mapping**

Mind mapping was first designed by Tony Buzan from the group of "learning methods" in England. This technique is based on research findings which indicate that brain functions in the first place with key concepts and in a related and integrate manner so that if we begin the work from a main idea, it will have better accordance with the pattern of brain thinking. Brain also needs replacement of the ideas that are related to the main idea. In order to achieve these goals, Buzan designed the technique of mind mapping (Geramineja, 2006).

Mind mapping is a process of individual brain storm. In thought flood, you are willing to create possible number of ideas even judicious

Table 1: Thought classification Based on intuitional and logical thinking

Thinker	Type of thinking	
	Intuitional (Creative thinking)	Logical
Bartlet	Creative	Bound system
Freud	Unconscious	Conscious
Gilford	Divergent	Convergent
Marzano	Creative	Critical
Geshtalt psychologists	Productive	Recreates
Debuno	Horizontal	Vertical

and useless ideas only when you write down on paper or record in any other way what occurs to your mind. It's quantity, not its quality, is what you are looking for. No criticism is permitted during the session of brain storm. Later, you can return to them and criticize your own records (and the records of others in group conditions).

You can also create new ideas through looking at what you have ever written.

Many researchers have been done about the function of the brain hemispheres in the fields of thought. The researches which have looked for the functions of the left and right hemispheres have identified two thought processes. The left hemisphere deal with spoken information and orders critical thought and is responsible for the codes of reading, language and mathematics in a logical, analytical and sequential manner. The right hemisphere deals with audio and visual information and rearranges old information and affairs in a new form. The right brain acts with intuition and some researchers believe that the right hemisphere has a main role in creative thinking (Hoseini, 2001).

Although researchers have indicated that the main function of the left hemisphere of the brain is mainly logic and reasoning and that the function of the right hemisphere of the brain is mainly intuition and illumination, some researchers hold that one cannot assign clearly these functions to the left and right hemisphere of the brain (Table 1).

### Innovation, divergent and convergent thinking

"Altshuler " was able to classify them through studying inventions. He divided invention into five levels (Samad Aqayi, 1999):

- 1- Obvious and solutions, 32 percent
- 2- Small innovation in a subject, 45 percent.
- 3- The biggest innovation in a technology, 18 percent.
- 4- Innovation beyond the domain of technology, 4 percent.
- 5- Discovery, 1 percent.

In a sense, the process of innovation is expressed by 4 Ds (Cooperrider *et al.*, 2008):

- 1) Discovery
- 2) Dream
- 3) Design
- 4) Delivery

Undoubtedly, the organizations of the present age face wide international changes and threats. Accordingly, the guarantee and continuation of their life and survival require finding new ways and solutions for confronting problems which have many connections with innovation and thinking type.

Some researchers and authorities such as Bartlet, Freud Gildord, Marzano, Geshtalt psychologists and Debuno consider creativity as a type of thinking.

Marzano classifies thinking in from of two groups; critical thinking and creative thinking.

- 1) Critical thinking: it is an intellectual and logical thinking which concentrates on what has been decided and deals with criticism, judgment and finding deficiencies. The objective of

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Table 2: Features and differences of critical and creative thinking

Critical thinking	Creative thinking
Analytical	Generative
Convergent	Divergent
Vertical	Lateral
Judgment	Suspended judgment
Possibility	Probability
Focused	Diffused
Objective	Subjective
Left brain	Right brain
Verbal	Visual
Linear	Non- linear associative
Reasoning	Novelty
Yes but	Yes and

critical thinking is to evaluate the appropriateness of the way of performing work.

2) Creative thinking: it is a type of thinking and ways for finding a unique way. In the majority of activities like problem solving, both

types of thinking have an important role.

The most important features and differences between critical and creative thinking are reflected in the following chart (Harris, 1998) (Table 2).

Gilford, the American Scientist, through many researches, finally came to the conclusion that one can divide human mental abilities into 150 separate factors each of which is measurable by itself. To him, some of these features are:

Mind flow fluency, thought powers flexibility and decision and thinking originality.

He believes that these features comprise divergent or abnormal thought. The persons who have divergent thought are different from others in thought and action and go away from the norm and habit and use new and creative methods. On the contrary, those who do not

Table 3: Types of Innovation Models in Organization

Organizational thinkers of 20 <sup>th</sup> century	Type of model	Feature of Model
First	Model of technological stress	1- Simple, linear monotonous process 2- Emphasis on research and development. 3- Emphasis on philosophy of productivity 
Second	Model of demand capacity (Market absorption)	1- Simple and monotonous linear process. 2- Emphasis on market and notice on costumer's needs. 3- The market is a source for the ideas of research and development and research and development have a reactive role. Market need → marketing → R&D → production
Third	Compositional Integration model	1- Monotonous but having feedback ranges 2- More balance between market, and research and development. 3- Emphasis on the integrated research and development, design and manufacturing
Fourth	Monotonous model	1- Parallel development with monotonous. 2- Powerful relation with suppliers and close interaction with customers. 3- Emphasis on the integrated research and development, design manufacturing
Fifth	Monotonous systems and network model	1- Parallel development and completely monotonous. 2- Using specialized system and simulation models in research and development. 3- Powerful relation with costumer 'Swill 4- Strategic integrated with main suppliers 5- Emphasis on the adaptability in development and emphasis on quality

Table 4: Approach of thinkers in 20<sup>th</sup> and 21<sup>st</sup> century

Organizational thinkers of 20 <sup>th</sup> century	Organizational thinkers of 21 <sup>st</sup> century
Planning	Foresightedness
Organizer	Leader
Controller	Strategist
Motivated	Learner
Of interest	Performer
Creator of profit	Creator of value

enjoy these qualities have convergent thinking and follow norms and habit of thought and action. Thus divergent thinking means going away from a joint point that is the very custom, tradition and norm of society and convergent thinking means approximating the same point (Geraminejad, 2007). Divergent thinking is a mental investigation for finding all the possible answers to a problem or an issue.

In a divergent thinking, unknown solutions follow various tracts. Divergent thinking is mainly used when the intended issue is unknown or ambiguous and / or there is no certainty, identified and recognized solutions for solving the issue.

Convergent thinking is the same as logical thinking in which a person is in search of a correct answer for the issue and / or goes toward certain and recognized answers.

Accordingly divergent thinking considers the innovation phenomenon within itself as a process.

### Innovation models in organization

Rothwell presents five generations of innovation in organization as explained in the following chart (Rothwell, 1992) (Table 3).

It should be mentioned that the role of research and development is prominent in all of the innovation model features.

### CONCLUSION

Nelson and Quick present five features for creative organizations as follows:

- 1- They develop participatory decision-making.
- 2- The leaders of organization encourage cre-

ative thinking.

3- Organizational structure has flexibility.

4- Creative persons are very successful in the organizations in which creative ideas are of value and the ideas of employees are tied to the ideas of organization leaders.

5- They believe in developing creativity and creating the background of instruction for solving problem creatively (Nelson and Quick, 1994).

A creative organization notices human capital as the most important and key job resource of the organization. Appropriate use with empowerment, leading value for stating and presenting idea, providing the background of the presence of all employees in the realization of organizational goals etc., also direction to human resources are the most fundamental organizational capital. Accordingly, the approach of organizing in the present century has been changed completely in comparison with the past century in the field of human capital.

The comparison of the principles of organizational thinkers, activities in the 20<sup>th</sup> and 21<sup>st</sup> century is as Follows: (Table 4).

Pinchot, in an article entitled "Intelligent Organizations" wants large Organizations to keep distance from the hierarchy system in order to promote entrepreneurship. In this article, after criticizing large organizations, he introduces intelligent organizations

This can provide a suitable for the growth and training of entrepreneurship.

In the opinions of Pinchot, intelligent organizations have five basic principles as follows:

- 1- Systematic thinking
- 2- Free access to information
- 3- Independence
- 4- Self – organizer systems

5- Selection instead of monopoly is a key feature of human capital in intelligent and creative organizations.

Accordingly, innovation and creativity that are of key features of human capital in intelligent

and creative organizations have an effective role in success and in facing the environmental wills and needs of today's society.

In the present century, the role of human capital is undeniable because of the high level of wills and expectations and complexity and variety of rendering services and products and, on the other hand the competitive aspect of the quality of services and products. Intelligent and successful organizations always have a direct relationship with absorbing and preserving human capital.

In conclusion, thought and idea has a particular place in intelligent and successful organizations as a huge resource in order to promote the services and product.

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