



# Creative potential of the human capital as the key resource of development of the techogenic civilization

## Potencial creativo del capital humano como recurso clave del desarrollo de la civilización tecnológica

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#### ABSTRACT:

In this paper, on the basis of complex socio-cultural methodology, the laws of development of the creative potential of a subject side of the productive forces in the situation of formation and development technogenic civilization are studied. The study of this problem, as well as its solution, is argued by the necessity to develop methodological justification of laws of the process of formation of creative potential of specialists in socio-economic sphere of technogenic society, who solve the tasks of creation of science-production-technological segment of its technosphere in the situation of the 6th Technological order. It is shown in the paper that utilization of the convergent technologies born by the 4th Industrial revolution in the situation of modern high tech production created conditions for transformation of professional knowledge of specialists (cultural knowledge of general character, professional knowledge, competences and value orientations) into special forms of capital. In modern social sciences this form of capital is called the human capital since its rational utilization provides for self-growing of added value on the basis of implementation of innovation potential of the human capital, the subject of which is cognitariat. Sources of the creative potential of the human capital,

#### RESUMEN:

En este trabajo, sobre la base de una metodología sociocultural compleja, se estudian las leyes del desarrollo del potencial creativo de las fuerzas productivas. El estudio de este problema, así como su solución, se argumentan por la necesidad de desarrollar una justificación metodológica de las leyes del proceso de formación del potencial creativo de los especialistas en el ámbito socioeconómico de la sociedad tecnogénica. Se muestra en el trabajo que la utilización de las tecnologías convergentes nacidas por la 4ª revolución industrial en la situación de la producción moderna de alta tecnología creó condiciones para la transformación del conocimiento profesional de los especialistas (conocimiento cultural de carácter general, conocimiento profesional, competencias y orientaciones de valor) en formas especiales de capital. En las ciencias sociales modernas, esta forma de capital se denomina capital humano, ya que su utilización racional proporciona auto-crecimiento de valor agregado sobre la base de la implementación del potencial de innovación del capital humano, cuyo tema es el cognitariado. Las fuentes del potencial creativo del capital humano, su esencia y las leyes de su implementación en la práctica social de la sociedad postindustrial se

its essence and laws of its implementation in the social practice of post-industrial society are justified in this article.

**Keywords:** postindustrial society; scientific and technological creativity; human capital; innovation potential of the human capital

justifican en este artículo.

**Palabras clave:** Sociedad postindustrial; creatividad científica y tecnológica; capital humano; potencial de innovación del capital humano.

# 1. Introduction

## 1.1. Problem Statement

On the edge of the 20th and 21st centuries, modern technogenic civilization gave start to qualitatively new, postindustrial, stage of its development, on the technological platform of which began appearing innovation society. The peculiarity of this society is a broad introduction of social oriented convergent technologies in all spheres of social production, which are named with the abbreviations of SNBIC and NBIC [socio-, nano-, bio-, info-, cogito- convergence].

Convergent technologies are developed based of the technologization of the most important achievements of basic sciences, which laid down a background for the 4th Industrial revolution. Its specifics are in integration of the key segments of scientific and technological knowledge in relevant technological complexes. Respectively, implementation of these technological complexes in the economic sphere should be based, firstly, at training of specialists who possess a high level of creative professionalism in the field of high tech. This, in turn, stimulates organizational and management activity of authorities, purposely focusing it on the formation of new quality of management in all system of social production, and first of all – on its social and professional structure. Cognitariat is a set of social groups defining, on the basis of development and introduction of innovations, the content of convergent technologies and formation of the scientific-industrial-technological segment of technosphere of the postindustrial society should be the central element of social-professional structure in the conditions of innovation economy. Comparison of implementation of convergent technologies in the situation of formation of innovation economics on the postindustrial stage of technogenic civilization in different countries of the global community allowed the economic scientists to come to the conclusion that social maturity and creativity of the subject side of productive forces of the society, meaning its human capital, has a determining significance in this process. The global experience indicates that in the situation of high tech production the human capital is the important strategic resource for the development of national economics, providing for sovereignty of national states in the conditions of tough market competition of the contemporary globalized world. In this connection, since the end of the previous century, more and more attention has been given to the study of laws of formation of the creative potential of the human capital both in western and eastern dimensions of social sciences. This article presented to the attention of readers also deals with these problems.

## 1.2 Research Questions

The research questions of this paper are connected with the analysis of the creative potential of the human capital as a strategic resource of development of postindustrial society.

The object of the study is the human capital in the system of social production, the subject of which is predominantly cognitariat. The subject of the research is the laws of mechanism of formation of the creative potential of the human capital in the situation of the innovation oriented economy of postindustrial society. The purpose of the study is to define on the basis of use of complex socio-cultural methodology the laws of mechanism of formation of the creative potential of the human capital as a strategic resource for development of the subject side of productive forces of innovation economy of postindustrial society.

## 2. Research Methods

Complex socio-cultural methodology that integrates methods of social philosophy, economics, sociology, and socio-philosophical anthropology has been used in this study. The application of this methodology has been concretized in accordance with the principle of historicism that allowed identifying dynamics of development of the creative potential of the human capital in the situation of technogenic civilization.

The utilization of complex socio-cultural methodology allowed the following: 1) to identify specifics of dialectical interconnection of culture of the society and its socio-economic and production-technological relations in the situation of use of convergent technologies; b) to identify the laws of the process of formation of the creative potential of the human capital and justify the systemic character of formation and implementation of its innovation component.

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## 3. Findings

### 3.1. Sources of the creative potential of the human capital, and its essence

The following theoretical provisions have been used as a methodology for study of the outlined aspect of the problem:

- The socio-philosophical concept of a society as a complex structured multilevel system of social relations that is formed due to social activity of its subjects – social groups united on the basis of common purposes and common activity in the system of social production.
- The concept of a man as a subject of theoretical cognitive and creative transformative types of activity that is executed in the system of social production.
- Understanding of creativity as a generic feature of a man to create, making material and spiritual artefacts in the process of creative transformative activity (Latin, artefaktum – artificially created), that are material and spiritual objects satisfying demands of the socium, which appeared in the process of social practice (Belenkova & Nadyrov, 2017, pp. 33-36).

On our opinion, socio-philosophical analysis of labor activity and its role in formation of social reality should be the basic methodological foundation when researching the sources and essence of the creative potential of the human capital as a socio-economic phenomenon. Friedrich Engels – one of the classics of the dialectical-materialistic concept of socio-anthropogenesis claimed: “Labor is the first basic condition of human life, and to a such extent that in some sense we should say: labor created a man himself” (Engels & Marx, 1961) . From the position of socio-philosophical analysis, labor is a cognitive and transformative activity of a man recognized by him, which is seen in the integrity of the two sides: objective (nature) and subjective (consciousness). In the process of labor, people transform the substance of nature in order to produce products and create conditions for their lives. The nature side of labor activity is a man as a natural biological being with inherent psychophysiological capabilities, socialized in the process of socio-anthropogenesis, but have not lost their biological nature; 2) aerials of nature with their specific natural and climatic peculiarities that determine the character and conditions of labor; 3) substance of nature as a subject of labor with its diverse potential capabilities necessary for satisfying people’s demands; 4) labor as a physical activity of a man executed on the basis of his natural psychophysical abilities, creative potentials of which are revealed in the process of labor. The spiritual side of labor activity is defined by the level of development of the essential forces of a man in the process of labor. It embraces the following: 1) knowledge; 2) various competences and skills to transform natural and social fragments of reality in the process of labor; 3) value-oriented worldviews and spiritual attitude of people to the world around them.

At the starting stage of the history of mankind the subject side of labor was fixed in the norms and requirements of traditions (Latin, tradition – transmitting, transferring), which

had a syncretic character integrating accumulated social experience and knowledge, as well as norms of behavior regulating activity of people. Professor V.E. Kemerov writes characterizing the role of traditions in formation of a society: "Traditions provide a simple reproduction of social life, transfer of social experience by its repetition and preservation of technological schemes, rigid interdependence of social attitudes, structures, cultural norms and stereotypes" (Kemerov, 2000, p. 94). In traditions, the priority belongs to the object side of labor, in the process of which the most optimal forms of it were identified by the trial and error method, or by intuition. Their relevance as a compliance with the objective laws of nature was checked due to multiple repetition of labor operations, in the process of execution of which the best results were identified and were considered as genuine ones. The goal-oriented labor for a relatively long time contributed to the fact that in the process of socialization of people that was a part of this process, formed such traits of character as: 1) curiosity and respect to knowledge, which became accessible to them because of active interaction with the world of nature, and to which ancient people gave a sacral significance; 2) high respect to mutual assistance and mutual support in the process of labor activity; 3) diligence and devotion to the family and tribesmen; 4) physical strength, courage, endurance, perseverance in achieving the posed goal, the qualities, which were considered as the traits of character providing for the preservation of species. All these traits of character were actively cultivated starting with tribal organization of human community and were transmitted from a generation to generation during the whole history of mankind. However, only in the situation of high tech production of the 21st century based on private property they received a status of "the human capital". In the meantime, mechanisms of creativity for the first time appeared for the first time appeared in the situation of this rather primitive, from the point of view of contemporary people, labor activity executed in the conditions of tribal organization of the society. These mechanisms were initially connected with cognitive and transformative activity and contained some hidden innovative possibilities of creative potential of a man, which manifested in their creative attitude to labor. Yet in ancient time people trying to adapt their lives in the struggle with nature guessed that creative abilities and capabilities allowing them to establish new living conditions laid in themselves. And forces that create these human abilities are external ones, both in their relations to a man, and to nature itself. These external forces determine the order created in accordance with certain laws, to which people must obey implicitly. In the monotheistic religions of Christianity and Islam, these Supreme spiritual powers are personified in the person of God the Creator. In Buddhism, this Supreme power is Brahman, the divine Soul of the Universe. Man, in accordance with religious views, is created by the Higher Powers as a part of nature, endowed with consciousness and spiritual energy. This energy is a part of Divine energy that allows a man also to become a creator, however, if he accepts the divine power and follows its testament. It is worth mentioning that the monotheistic religions in the mystified form revealed the mystery of creative abilities of a man. The essence of this mystery is that the nature and man are identical to each other, since they are created by the Creator according to the same laws. On this reason, a man interacting with nature in the process of labor activity is able to discover these laws for himself and create in accordance with them. Such a vision of the nature and a man as part of nature created by the Divine Reason, played the defining role in the formation of natural science mechanistic picture of the world by the philosophy of the New Time that determined the principle of development of natural sciences and mathematics in that epoch. It is not by accident that the great British scientist Isaac Newton (1643-1727) called God a Genius Watchmaker who created the world according to the laws of mechanics, which people themselves had to find out and use for creation of mechanical objects. With the development of natural sciences in the framework of West European culture and with its influence on the philosophy, the logical and analytical approach in understanding the essence of a man received priority significance. In the most constructive way, this approach is realized in the philosophical concepts of G.W.F. Hegel (1770-1831) and K. Marx (1818-1883). Hegel analyzed the creative and transformative activity in the mystified form of the objective idealism. Because of that, he saw a source of creativity in the intellectual abilities of The Supreme Reason, which he considered The Supreme Demiurge of creativity.

K. Marx analyzed the problems of creativity in the framework of materialistic dialectics. In

the meantime, in this work he relied on the Hegel's analysis and operational mechanisms of creative and transformative activity elaborated by him in the framework of the objective idealism. According to Hegel, these mechanisms included two dialectically interconnected sides: "desobjectivation" and "objectivation". Desobjectivation (from the term "subject" – the object to which cognitive activity of a man is directed in the process of cognition. The purpose of desobjectivation is to identify by the knowing subject information about properties of the known object (the fragment of material or spiritual realities) and to define, based on this information and in accordance with the principle of reflection, its properties determining the essence, and also possibilities to transform the object or create a principally new object responding to the new demands of people. Objectivation is a process of the embodiment in the material of new forms of reality able to satisfy new social needs.

Artefacts of creativity (Latin arte – artificial + factum – made) – material and ideal objects, which are created by the creator on the basis of cognition of the objective laws of being and its reasonability. In accordance with the Hegel's concept, artefacts of creativity are objective in their content. They reflect the essence of the Supreme Reason, which determines the logic of the development of nature. However, they are subjective on their form, embodying the integrity of the logic of development of the Absolute Idea and consciousness of a man.

Karl Marx was well aware with the works of G.W.F. Hegel and his ideas about development of intellectual and spiritual abilities of a man, which are actualized due to his interaction with the energy of the Absolute Idea, the carrier of which is the Supreme Reason. Interpretation of dialectical works of Hegel with the position of materialistic dialectics allowed K. Marx to justify the objective, system and creative nature of social activity, in the process of implementation of which creative essential forces of a man as a creator are opened up, and social life as a complex structured social system is formed. The content of this social life is determined by the relations of property, as well as by the forms of the people's activity defined by the conditions of their lives. According to Marx, the key moment of formation of the creative abilities was a development some work tools by a primitive man, in which understanding of possibilities to use the materials of nature for creation socially significant objects were embodied for the first time. Karl Marx discovered the link between the subjects of creativity (knowing and acting man) and the object (a work tool) that is created in the process of labor, and also between the means of activity (this is something by that the activity is executed) and its results (Marx, 1974, p. 164). The mechanism of this link was formed, according to Marx, based on the method that he expressed in the term "wrapping method" but modern psychologists call "outrunning reflection". The sense of this method was in the following: when solving the problem of creation of the principally new object, the purpose determining the content and character of the activity, as well as the result achieved at the first stage later become the means for achieving subsequent, and at the end, the final result. The basis for preservation of experience and for transmitting it to next generations, for which this experience becomes a starting position for their subsequent creative activity, is laid down due to that. According to Marx, this is creativity, where conditions for humanity's transition from the Kingdom of necessity to the Kingdom of freedom should be formed, in which a man would act in accordance with his own universal measure embodied in him by nature, and which he would more and more comprehend in the process of labor. In Marx dialectic and materialistic approach to the essence of a man and human society, the creative aspect to a different extent exists in all forms of social transforming activity. The specifics of its directions and forms are determined by the subject of creative transforming activity and its results. It is worth to note that there is an innovation creative aspect in all forms of creativity, such as science, education, management, and its results interact in the framework of the unitary system of social creativity as its separate parts. This is determined by the laws of interconnection of separate forms of substance and the character of social transforming activity (Aupov & Belenkova, 2016). Although a man is a part of nature and is subordinate to its laws, each man has an ability to create. It is born from the depths of the human spirit. The source of creativity is the needs of a person and his desire to reveal through himself the in-depth essence of the object under study, relying on his subjectiveness, that is his knowledge, skills and intuition. Considered as a set, these components of the human consciousness form the creative potential of his thinking, the most important elements of which is the innovation aspect of thinking: to reveal unknown

and create that has never existed before (Belenkova, 2016).

The category potential (Latin *potentia* – power, strength, possibility) is multi-dimensional and widely used both in natural sciences and in humanities. Scientific use of this term is deeply rooted in the philosophy of Aristotle who introduced the concepts of the “act” and “potency” when studying ontological background of the motive forces of development of the subjects of being. According to Aristotle, “potency” (reality and possibility) is the ability of things to be not what are “substance”, “quality”, “quantity” and “place”. In other words, “potency” is an ability of things to execute their qualitative transformation in the process of actualization of its possibilities but when necessary conditions exist. The “Act” (energy) is the active execution, a change of things in accordance with the formulated purpose (Aristotle, 1075, pp. 71-75, pp. 155-157, pp. 229-231). Such a treatment of a concrete fragment of the objective reality (a subject or a process) allows a researcher, when the problem arises, to model its solution based on the conditions of how the object appeared and what was its dynamics of development. Respectively, a scientific problem should be considered in the integrity of its 1) past (potential possibilities of transformations – a resource of transformations); 2) present (actual in the state of the object – a reserve of transformation); 3) future, in which, based on the integration of the resources and reserves, the possibilities of the past and present are actualized and the future is modeled. The term “potential” defines the extent of possible manifestation of some actions or functions. In social sciences the term “potential” characterizes possibilities of a person, society or the state in different spheres of activity. The implementation of these possibilities in any sphere by individuals, society or the state is determined by the availability of necessary sources, means and deposits, which can be used for the solution of the posed task in order to achieve the set purpose. Therefore, the innovation aspect of the creative potential of the subject of creativity is built, on the one hand, on the basis of integration of knowledge, skills and creative desires of previous generations, and on the other hand, on the basis of utilization of the newest achievements in different areas of natural sciences, technology, and socio-humanitarian knowledge, which reveal possibilities of transformation of the object or creation of the principally new object responding to the actual social needs. Herewith, a dynamic integrity of the old (traditions) and the new, modern (innovations) should be maintained in the created innovation systems. Based on this analysis of the creative and transforming activity it is possible to conclude that the creative element is primordially present in the social practice forming its innovation component, which stimulates creative activity of the subjects of activity (although not always and not to everybody) and thus provides evolutionary development of the whole system of social production.

### **3.2. Implementation of the creative potential of the subjects of activity in social practice**

For a long time, implementation of the creative transformative energy of mankind was executed spontaneously, although it provides for identifying certain laws. In this aspect, the creative achievements of the epoch of the European Renaissance (14th – 17th centuries) are indicative enough, when in new historical conditions such countries as Italy, England, the Netherlands and France actualized creative achievements of the antiquity. It happened due to intensively developing productive forces of the European civilization based on the manufacture production. In the epoch of the European Renaissance the model of a man-creator was formed. Contemporary Russian scholar Academician V.S. Stepin stipulates: “A special understanding of a man, created in the image and likeness of God, was developed, and the cult of the human mind, able to understand and comprehend the mystery of the Divine creation, was formed to decipher those writings, which God has placed in the world. And the purpose of knowledge was considered to decipher the Providence of God, the plan of Divine creation, implemented in the world” (Stepin, 2006, p. 93). Thus, creative and transformative thinking began forming in the consciousness of the educated people of the epoch of the Renaissance, focusing people on the cognition of nature and its transformation based on the known laws, which at that time were considered as the Divine laws. As a consequence, since the epoch of the Renaissance natural sciences and technical creativity

have been intensively developed in Europe. They have become the thought out and goal-oriented activity with educated people as subjects of this activity. For educated creators of the epoch of the Renaissance, the worldview of which formed on the ideas of antique philosophy postulated principles of integrity, harmony and proportionality of the Universe, science and technology started being interpreted as mutually conditioned spheres of cognitions, and the image of technology obtained an aesthetical character (Belenkova & Nadyrov, 2017, p. 37). In the most overt way, this understanding of the essence of creativity is embodied in the genius of Leonardo da Vinci. He was the great scientist, engineer and artist, and in his works integrated significant achievements in the fields of natural sciences, art, engineering and technical practice (Belenkova & Nadyrov, 2017, p. 37). Therefore, it was the epoch of the Renaissance when "cultural matrix of the creative thinking of technogenic civilization was laid down, and technology formed by the generation of new scientific knowledge and its implementation in technological process became a basis for the life activities" (Stepin, 2006, pp. 93-94]. Starting with 17th century, the achievements in natural sciences have begun actively implemented in the sphere of industrial production that gave the start to its technologization. Industrial technologies developed on the basis of integration of science and technology represented such form and stage in the development of technology, when its creation was conceptually conditioned and structurally based on the new knowledge (Belenkova & Nadyrov, 2017, p. 38). The first industrial technologies developed predominantly in the textile industry. They were elaborated due to the two genius inventions. The first is the multi-spindle spinning wheel "Janie" [J. Harris]. The second was the steam machine [J. Watt]. Their introduction caused mechanization of labor and beginning of mass production. The leading countries that introduced the first steam machines were Great Britain, France, and Belgium. Mass introduction of industrial technologies lead to the formation of the 1st Technological order that determined transition of all system of social production on the principally new, industrial, level of production that is characterized with the following features:

1. Confirmation of commodity-market relations and a market as the major form of exchange of socially significant activities and their results.
2. Transformation of legally full-fledged property into the main form of property ownership.
3. Utilization only economically stimulated labor of privately free producers in the economic sphere.
4. Legal prohibition of turning a person into a property (Belenkova & Vezhnina, 2016, pp.33-34).

The formation of a new type of industrial and technological relations based on the private property on the means of production, and utilization of work of economically free workers occurred due to, at first, victorious bourgeois revolutions of the 17th – 18th centuries in the leading countries of Europe that liquidated the feudal form of property for the means production and led to the formation of the state of law and civil society. Secondly, it happened due to intensive development on the natural sciences knowledge in the process of the 1st Scientific revolution of the 17th century that became a basis for the development of industrial technologies. They determined not only technological basis of the capitalist economic relations but also formation of a qualitatively new social structure of a society. In these circumstances, the following phenomena started getting market values: first, science connected with development of industrial technologies; second, labor of direct producers, from the skill and diligence of which depended labor productivity and market profitability of industrial enterprises; and third, the background of industrial management was laid down. The industrial society that formed at the edge of the 17th – 18th centuries was innovation-oriented society in its development. Its innovation character was based on the integration of science, technology, human capital and management. The integration of these factors was executed due to the systemic character of social production based on the dynamics of market competition, industrial technologies and constantly improving management. The technogenic society formed at the edge of the 17th – 18th centuries received a name of the "industrial" society (industria – diligence, dedication), since it was created by the goal-oriented and innovative labor of industrial entrepreneurs inspired by the idea of servicing

with the creative labor to God. It is referred in the works of the outstanding sociologist of the 20th century Max Weber in the treatise "Spirit of capitalism". According to him, capitalism as a special form of economic relations based on the private property was created by the labor of capitalist entrepreneurs, who considered success of their industries as the meaning of life, destination and salvation in the hereafter, which will be provided by God the Creator that they serve with their work (Weber, 1990, p. 97). The Russian Academician S.Yu. Glaziev believed that the industrial civilization has gone through five technological orders and three industrial revolutions (Glaziev, 1993). The 4th Industrial revolution that is now under formation stimulates creation of principally new technologies on the basis of fundamental discoveries in natural science taking place on the edge of the 20th and 21st centuries. Technologization of this knowledge leads to the in-depth integration of scientific and technical creativity. It has the following consequences: 1) the whole system of social production begins transforming in the direction of innovation changes, and establishes a basis for the innovation economy; 2) market competition for resources between countries and transnational corporations sharpens, and labor resources become the most important, especially those that are professionally trained and possess creatively oriented innovation potential; 3) capitalization of such basic resources of the forming innovation society as science, social networks and relations, spiritual and intellectual aspects of the labor potential of producers takes place, and this is formulated with a concept of "the human capital".

The first attempts to justify social significance of the subject side of the productive forces, that is the level of professional training of specialists in the conditions of industrial technologies took place in the works of English political economists of the 18th century. So, Adam Smith wrote, that "increasing productivity depends primarily on improving the dexterity and skill of the worker, and then on improving the machines and tools with which he works» (Smith, 1956). However, in accordance with mechanistic treatment of the essence of a man that dominated at the New Time, Adam Smith advised not to increase professional training of a worker but operationally simplify a work process splitting it on separate operations (Smith, 1956). With complication of industrial technologies, connection between the machine and the worker was also repeatedly complicating. Analyzing the process of capitalist production, K. Marx introduced a concept of the labor force as integrity of physical and spiritual abilities of workers providing with their productive labor the profitability of production (Marx, 1981). However, only in the second half of the 20th century economic scientists came to understanding that the subject side of the productive forces, such as professionalism and responsibility of workers, in the situation of high tech production become its key resource. A theory of the human capital has been developed by mutual efforts of predominantly American economists, and three Nobel prizes have been awarded for that. Semyon Kuznets (1971), Theodor Schultz (1979) and Gary Becker (1992) became the Nobel Prize laureates. Since 1990s, the problem of human capital and outlining laws of formation of its creative potential has been actively studied by Russian sociologists and researchers in the field of theory and practice of management. The solution of the task of formation of the creative potential of national human capital in contemporary Russia is conditioned by the necessity to ensure sovereignty of the Russian economy and find a proper place in the integrated system of global economics. In experts' views, socio-economic phenomenon of the human capital should be considered as a system set of knowledge, intellect, productive labor, health and quality of life of individuals incorporated in socio-ethnic communities and socio-production organizations, in the framework of which the abilities of the human capital are concretized at the level of workers in the form of their creative potential (Belenkova, 2017, p. 280).

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## 4. Conclusions

Based on the study of the role of the human capital in the process of formation and development of technogenic civilization, the authors came to the following conclusions.

The sources of formation of the innovation potential go into the depths of millennia of human history and are connected with creative activity of people on transformation of the substance of nature with the purpose of producing the subjects of consumption, which optimize their life conditions.



The essential powers of a man are actualized in the process of cognitive and transformative activity, and mechanisms of socialization are switched on. It includes traditions, education and upbringing. They provide for formation of the creative potential of individuals that is constructed on the integration, on the one hand, of knowledge, experience and creative achievements of the previous generations, and the most recent achievements of science, revealing possibilities of transformation of the actualized objects or creation of the new objects in accordance with the new social needs, on the other hand.

Implementation of the creative potential of the subjects of economic activity is determined by the level of development of material and spiritual culture of the society and its productive forces, in the process of development of which the needs of direct producers in self-actualization of their essential powers in creative and transformative activity increase.

Capitalization of the subject side of the productive forces of the society and formation of socio-economic phenomenon of the human capital takes place at the postindustrial stage of development of technogenic civilization. The authors consider the human capital as a systemic integrity of cultural and professional knowledge and competences, and also productive labor, health and living conditions of subjects of high tech production. Social and ethnical communities or social organizations in the framework of which the human capital is concretized at the level of workers in a form of their creative potential are the subjects of the human capital.

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