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**EXTENDED REPRODUCTION OF HUMAN POTENTIAL IN TODAY'S ENVIRONMENT**

**Abstract.** *The article considered essential characteristics of the processes of reproduction of human potential as the continuous recovery of functional components of subject of certain level in unity, contradiction and steady development of vital, social and spiritual characteristics. Communications and relations, concentrated in the category "human capital" are observed. Such phases of its reproduction, as accumulation, capitalization and development are identified and analyzed. The ergodynamic model of human potential reproduction is proposed. It considers input and output scales of human potential and includes a clear focus on all possible vectors of changes of intensive and extensive recovery factors.*

**Keywords:** *human potential; extended reproduction; phases, types of reproduction; capitalization; ergodynamic model*

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**РОЗШИРЕНЕ ВІДТВОРЕННЯ ЛЮДСЬКОГО ПОТЕНЦІАЛУ В СУЧАСНИХ УМОВАХ**

**Анотація.** *У статті розглянуто сутнісні характеристики процесів відтворення людського потенціалу як безперервного відновлення функціональних компонент суб'єкта певного рівня в єдності, протиріччї та невпинному розвитку вітальних, соціальних і духовних характеристик. Досліджено зв'язки та відносини, сконцентровані у категорії "людський потенціал", виділено й досліджено фази його відтворення: накопичення, капіталізація, розвиток. Запропонована ергодинамічна модель відтворення людського потенціалу, що враховує його вхідний та вихідний масштаби, а також формує уявлення щодо усіх можливих векторів змін чинників інтенсивного та екстенсивного відновлення.*

**Ключові слова:** *людський потенціал; розширене відтворення; фази, типи відтворення; капіталізація; ергодинамічна модель*

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**РАСШИРЕННОЕ ВОСПРОИЗВОДСТВО ЧЕЛОВЕЧЕСКОГО ПОТЕНЦИАЛА  
В СОВРЕМЕННЫХ УСЛОВИЯХ**

**Аннотация.** *В статье рассмотрены существенные характеристики процессов воспроизводства человеческого потенциала как непрерывного восстановления функциональных компонент субъекта определенного уровня в единстве, противоречии и непрерывном развитии витальных, социальных и духовных характеристик. Исследованы связи и отношения, сконцентрированные в категории "человеческий потенциал", выделены и исследованы фазы его воспроизводства: накопление, капитализация, развитие. Предложенная эргодинамическая модель воспроизводства человеческого потенциала, учитывающая его входной и выходной масштабы, а также формирующая представление обо всех возможных векторах изменений факторов интенсивного и экстенсивного восстановления.*

**Ключевые слова:** *человеческий потенциал; расширенное воспроизводство; фазы, типы*

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*воспроизводства; капитализация; эргодинамическая модель*

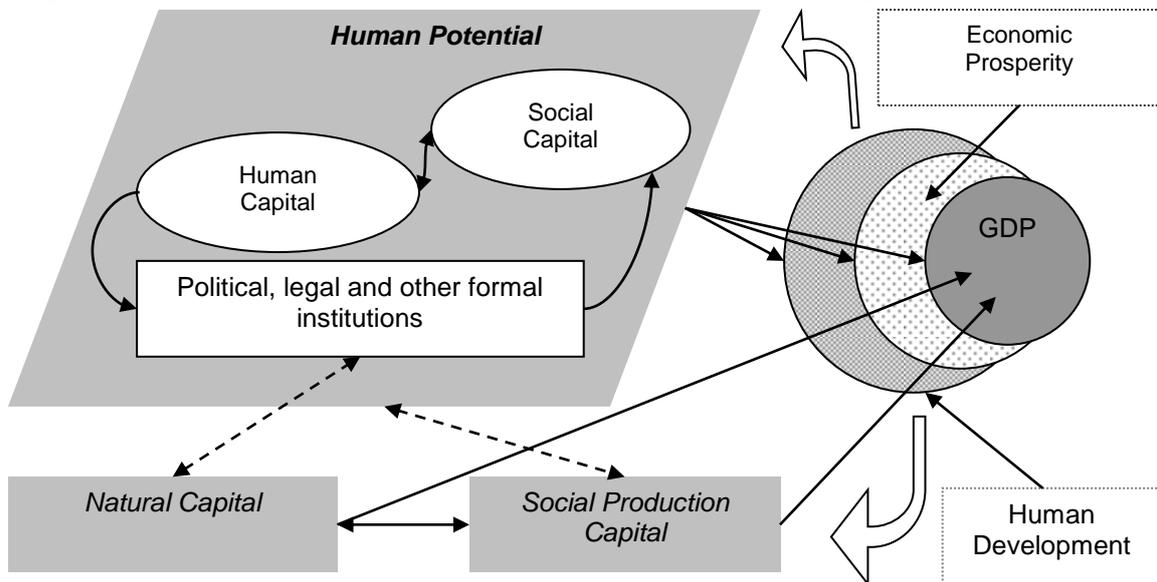
**Rationality of the research topic.** Contemporary globalization transforms the knowledge of economy into the most prospective model of social and economic development, the basis of which involves the growing role of science and education for social progress. The key position is given to a human being, a person capable to effectively implement the accumulated potential, that is the accumulated reserve of health, creative skills and competencies, as well as different types of activities, which can be realized in various spheres of social and economic activities and are able to generate the income, to change the structure of needs and to influence the economic welfare. The system of national wealth factors includes productive forces, generated by the population, as the real asset for providing a high level of development and prosperity of the state, even in conditions of relative scarcity of its own natural resources. The following issue has been long time established and well known in contemporary economic researches. However, dynamic changes in the area of human existence cause the loss of rationality within the concepts of "human capital" and their traditional idea of a human being as a resource that may be "consumed" in a specific way for the processes of industrial or social nature.

**Articulation of the problem.** Despite the relevance and great practical value, the methodology for the research of human potential, including the processes of its reproduction, is not completely articulated and requires deeper scientific substantiation.

**Analysis of recent researches and publications.** The question of reproduction of human potential has been investigated by such leading scientists as V. Antoniuk, A. Grishnova, T. Zayats, E. Kataytseva, A. Kolot, E. Libanova and others. Still, further research on the given subject is urgent in view of the context of the modern stage of transformational changes.

**Problem definition.** The research goal is to identify specific features of extended reproduction of human potential in the national economy.

**Summary of the main material.** Today, human potential not only determines the capabilities of a country or a region to obtain creative and qualified personnel in future, but also affects the process of extended social reproduction, closely related to the issue of human capital, while being its basis and forming main principles of human development and economic prosperity (Figure 1).



**Figure. 1. Place of human potential within the system of social relations\***  
*\*worked out by the authors*

Investigation of theoretical foundations of human potential development made it possible to distinguish its theory, hypothesis and concept, to determine laws and regularities of its functioning, in par-

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ticular main principles of its development, which are inertia, flexibility, continuity and stability, to describe component elements of human potential, such as: demographic element; education; qualification and professional element; health; informational element; migration; entrepreneurial and motivational potential, to establish levels at which the process of human potential extension and transformation into human capital takes place, as well as to identify methods of human potential evaluation [2].

In fact, generalization of scientific researches on human potential, human capital and human development allowed to reveal essential characteristics of the process of human potential capitalization, being considered as a positive factor in fostering economic growth onto various economic levels, and in today's environment is rendered as a system of economic relations concerning accumulation of human capital by directing incomes to the increase of its scales.

The process of human potential reproduction has a complicated nature, because, on the one hand, it is determined by biosocial resumption of quantitative and qualitative characteristics of the population, and, on the other hand, it depends upon the level of social and economic relations of national economic systems. Quantitative characteristics of human potential can be reproduced only through the constant change of generations (childbirth, death and mechanical motion of the population). Reproduction of qualitative characteristics of human potential appears because of social progress of the humankind (spread of literacy, increase of educational level, preservation of physical and mental health, enhancement of cultural level, spiritual upbringing, etc.). Since all the above-mentioned characteristics require efforts and resources from both the human and entire subjects of national economic system, together with the use of numerous formal and informal institutions, it could be argued that the human potential reproduction reflects the totality of social and economic relations, characterizing connections and relations concentrated in its conceptual structure.

Reproduction of human potential can be analysed in a similar manner, from the standpoint of indissoluble unity of social production, which consists of four phases existing at the same time: production, distribution, exchange and consumption. Although each of these phases is self-sufficient and proceeding through their own stages of development and improvement, all of them are combined by the complex system of direct and feedback connections within the limits of recovery process. It should be noted, that the use of such division for the investigation of processes of human potential reproduction is possible with a certain degree of conditionality, as it is quite difficult to make a clear analogy between the course of purely biosocial and social and economic phenomena.

In temporal dimension, there are three levels of connections and relations, which are concentrated in the category of "human potential" and can be used for highlighting and investigating its reproduction phases.

First of all, these are connections and relations reflecting the past. They are a combination of properties of human potential, accumulated and implemented during the entire history of human activity. In the first phase of reproductive cycle, associated with production, initial value of human potential is formed, as a result of either the work of nature on "designing" the carriers of potential [1], or, on the contrary, the return of investments conducted under various social institutions (family, educational institutions, social institutions, etc.) during the previous cycles of reproduction. It is necessary to notice that human potential, as well as any other potential, due to its economic nature, determines only the possibility of obtaining money incomes, rather than their guaranteed reserve. Bearing in mind that only human capital is able to generate the income; it can be argued that the phase of human potential accumulation corresponds to the first phase of social production – that is actual production. In this case, time and cost expenses are fully spent on the reproduction of human potential [7: 53]. Since accumulated human potential of the first phase ( $HP_1$ ) also reflects its growth, it can be displayed as a formula:

$$HP_1 = VHP + FC_1 + t_1 = VHP + \Delta HP_1 \quad (1)$$

here  $VHP$  is a vital human potential,

$FC_1$  is financial capital spent in the first phase (looking after a child, upbringing, education and socialization of a child, etc.);

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$t_i$  is time spent on creation of human potential in the first phase, that is looking after a child, his upbringing, education, socialization, etc.

$\Delta HP$  is accumulated human potential,

$\Delta HP_i$ , in its turn, is the sum of social (relational) potential ( $SP_i$ ) and spiritual (intellectual) potential ( $IP_i$ ) accumulated during the following phase:

$$\Delta HP_i = SP_i + IP_i \quad (2)$$

Type and nature of human potential, generated during this phase, determines the vectors of human capital, as well as peculiarities of other stages of movement of potential component elements.

Secondly, there are relations and connections that characterize the present. This type of connections and relations corresponds to the second phase of reproductive cycle, which is the phase of human potential capitalization, including the processes of transformation of human potential into the capital and its self-expansion. This phase involves distribution and exchange of capitalized human potential. Initially, accumulated and demanded human potential is focused on the labour market, which is the place of its distribution by industries and activity spheres, thus functioning in the process of social production and transforming into the capital. Consequently, there is a determination of specific gravity of individuals and various social groups – as the carriers of functional component of human potential – for the social product created by means of their resources. Capitalization of human potential is a process of growing market value of human resources at various levels – from individual (personal) to national level – at different stages, having its effect as the positive dynamics of indicators of human potential efficient use together with the increasing life quality, so performing as the basis for human capital development and implementation of framework conditions in the context of innovative regional economic growth [3].

Professional activities, as the part of labour force at particular enterprise, is a necessary condition, though this environment is not sufficient for the transformation of human potential into human capital. Indeed, from the perspective of economic theory, only capital can be the proper ground for the extraction of economic benefits. Therefore, it is not possible to return investments on human potential development or to gain profits from its use, until human potential is transformed into human capital.

Originally, at the stage of distribution, human potential capitalization opens real possibilities of getting money income, while at the stage of exchange there is a compensation of expenses during the phase of formation of high-quality human potential due to the process of inflow, when production participants receive those shares of social product that have been identified at the stage of distribution. Thus, functional components with the funds invested in them during the phase of accumulation, get their monetary value in the course of their use in industrial and business activities. Specific features of this process indicate that the money return to the carrier of human capital, instead of the direct investor (in this case it is the abstract category with a complex subject composition, where it is almost impossible to define a particular contribution of each of the entities into the value of human capital). The process of human potential capitalization in the second phase of reproductive cycle ( $HP_{II}$ ) can be represented as follows:

$$HP_{II} = HP_I - \Delta VHP + HC + FC_{II} + \Delta SP_{II} + \Delta IP_{II}, \quad (3)$$

here  $\Delta VHP$  corresponds to a natural decrease of vital human potential,

$FC_{II}$  is financial capital, which is returned to the subject as a part of the income received from capitalization of its potential;

$\Delta SP_{II}$  is the increase (decrease) of social potential in the second phase;

$\Delta IP_{II}$  is the increase (decrease) of intellectual (spiritual) potential in the second phase.

Thirdly, there are relations and connections focused on the future. Direction and nature of the accumulation and capitalization processes of human potential in the past and the present determine its future opportunities [5]. Correspondently, there is the last phase of the reproductive cycle – the phase of development. This stage, within its scope, involves the money received as the income out of imple-

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mentation of accumulated functional components, which have been consumed and expended for the recovery of both physical and intellectual (spiritual) forces required during the labour activities, and this money is advanced into the further self-development and self-improvement of both the employee and his family. In the third phase, the process of human potential reproduction gets the following form:

$$HP_{III} = HP_{II} - \Delta VHP - FC_{III} + \Delta SP_{III} + \Delta IP_{III}, \quad (4)$$

here  $\Delta VHP$  is a natural decrease of vital human potential,

$FC_{III}$  is financial capital that has been spent on the recovery of both physical and intellectual forces;

$\Delta SP_{III}$  is the increase (decrease) of social potential in the second phase;

$\Delta IP_{III}$  is the increase (decrease) of intellectual (spiritual) potential in the second phase.

Evidently, the exchange and consumption are closely intertwined with each other. This connection reveals the fact that the amount of money, the employee gets for his work, depends respectfully on his ability to arrange his everyday life and the life of his family. The nature of the above-mentioned connection is as follows: upbringing and education, that a person receives in the process of primary socialization, has a great impact on the level of demand for his or her human potential, as well as the further human capital.

Judging upon the foregoing information, reproduction of human potential can be defined as a continuous process of restoring the functional components of the subject of a certain level (an individual, a group, community or population) as a kind of integrity, the main peculiarities of which are disclosed in the unity, contradiction and steady development of vital, social and intellectual (spiritual) characteristics.

However, there is no complete investigation of the process of human potential reproduction without the proper determination of its main types, which can be simple, narrow (shortened) and extended.

Simple reproduction of human potential suggests unchangeable level of keeping the qualitative and quantitative characteristics of its functional components.

Shortened reproduction of human potential foresees consecutive reduction of human potential scales. S. Kapitsa notes that the very fact of narrow reproduction is an indicator of social and economic incapability of human community [4].

Extended reproduction of human potential considers improvement and extension of its functional components.

The processes of human potential reproduction, independently of their types, are dynamic synergetic processes of reflecting the continuous adaptation of biologic determinations of demographic growth correspondently to the change of economic environment (this is mostly the recourse supply) and social relations generating upon the following ground.

Hence, an ergodynamic model of human potential reproduction shows that the simple reproductive cycle begins and ends with the stable scope of human potential  $HP^n$ . Moreover, there are various combinations of qualitative and quantitative factors: firstly, it is a stable correlation of both qualitative and quantitative factors; secondly, there is the same rate of increasing the qualitative factors and decreasing the quantitative ones; thirdly, when qualitative factors are decreasing, quantitative factors, in their turn, demonstrate a negative effect out of their reduction.

The procedure of shift from the simple type of reproduction to the narrow (shortened) reproduction is expected when the scope of human potential entering the current cycle of reproduction is smaller ( $HP^{n-1}$ ) than the scope of human potential included into the previous cycle ( $HP^n$ ). Narrow type of reproduction can be involved under the following conditions: firstly, qualitative factors are decreasing, while quantitative factors remain stable or demonstrate slower rates of increasing; secondly, qualitative factors remain unchanged, while quantitative factors are decreasing or having slower increase if to compare with the reduction of qualitative factors; thirdly, qualitative factors are decreasing simultaneously with quantitative factors.

Accordingly, extended cycle of reproduction is possible when the scope of human potential entering the current reproductive cycle is bigger ( $HP^{n+1}$ ) than the scope of human potential included into the previous cycle ( $HP^n$ ). As a result, such combinations of intensive and extensive recovery factors

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can be generated: firstly, qualitative factors are increasing, while quantitative factors remain unchanged or demonstrate slower rates of decreasing; secondly, qualitative factors remain unchanged or get reduced, while quantitative factors are increasing faster in comparison with the reduction of qualitative factors; thirdly, both qualitative and quantitative factors are increasing simultaneously.

It is quite clear that extended reproduction of human potential must be a thoroughly organised process, by means of optimal combination of the scales of extensive and intensive impact. Extensive approach foresees the growth of population of the country in terms of increasing childbirth, as well as the reduction of death rate, decreasing migration outflow and enhancing of migrational attractiveness of the country. At the same time, the quality of created labour recourses is not so urgent. Intensive approach considers improvement of the quality of human recourses as the most important issue and the basis for the extension of labour productivity, while the entire objectives of economic development can be achieved with the help of less amount of labour recourses. In this regard, enlarging the absolute population quantity (that is the population in active economics) is an intended objective, rather than a key goal. Therefore, intensive approach to the human potential reproduction is determined as a more complicated technique, requiring more profound and reasonable administrative decisions aimed at the long time perspective, together with more coordinated activities of the state authorities, citizenship and business both at the labour market and in the social area. In view of such features of motion and changing, the search for the means of human potential development, as well as the methodology for its managing at every stage, becomes more complicated and relevant.

Now it is time for a new paradigm of managerial technologies, which is mostly based upon the prior role of a creative personality in the context of administrative subject, so that collective intellectual abilities of the society, apart from generalised institutions and administrative structures, will be the motive power of productive transformations. It is obvious, that intellectual systems of management and self-government, represented by creative and motivated personalities, are capable to achieve excellent results in administration and public affairs, to provide a proper environment and high level of organisation in the social sphere. The most important task of administrative authorities is to ensure total engagement of the most intelligent citizens into managerial and self-governmental activities, demanding the foundation of special administrative group, the representatives of which will be able to perform their main responsibility of creating a proper environment for self-development and self-expression of human potential and its entire forces [6, 23-24].

**Conclusion.** Therefore, dynamic nature of human potential, as well as numerous unrealized opportunities and hidden recourses demand the investigation, regarding the variability of conceptual structure of human potential within the time and space. That is why, reproduction of human potential depends upon the efficiency of social and economic innovations in the country, the quality of life for the population and current demographic processes. The most important thing is that modern stage of development involves the search for effective methods of governmental control of human potential in any phase, and directing the vector of its change to the extended reproduction.

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