Managing sustainable development by human capital reproduction in the system of company’s organizational behavior

O Arefieva¹, O Polous¹, S Arefiev², V Tytykalo³ A Kwilinski⁴
¹ National Aviation University, Kyiv, UA
² Kyiv National University of Technologies and Design, Kyiv, UA
³ Bogomolets National Medical University, Kyiv, UA
⁴ The London Academy of Science and Business, London, UK

ORCID ID 0000-0001-5157-9970
E-mail: lena-2009-19@ukr.net
ORCID ID 0000-0002-4639-4493
E-mail: polousolgavictorovna@gmail.com
ORCID ID 0000-0003-2184-458X
E-mail: arefiyso@ukr.net
ORCID ID 0000-0001-9461-5521
E-mail: v.tytykalo@gmail.com
ORCID ID 0000-0001-6318-4001
E-mail: a.kwilinski@london-asb.co.uk

Abstract. In the framework of this study, the essential features of the systematic approach application in the process of managing sustainable development by company’s human capital reproduction and intellectualization were identified. The characteristics of the system that are able to ensure its integrity, continuity of operation, adaptability and ability to self-study, self-organization are highlighted. The successive stages of individual human capital reproduction in the process of its circulation are determined. The key stages of company’s human capital reproduction with taking into account the factors of internal and external environment are singled out. Production volumes for industrial enterprises of Ukraine using the Cobb-Douglas function are predicted. Levels of company’s organizational behavior for the purpose of defining features of company’s human capital reproduction on each of them are allocated. The mechanism for managing sustainable development by human capital reproduction in the system of company’s organizational behavior is offered. A set of measures aimed at effective implementation of the proposed mechanism and intensification of the company through its human capital reproduction in the system of organizational behavior are developed.

1. Introduction
Based on the fact that the process of managing sustainable development by human capital reproduction is an economic process, which is emphasized in a number of works of domestic and foreign scientists [1-6], the methodology of its study can be based on a systematic approach, which is acceptable for the enterprise’s, country or world economy. A systems approach allows you to consider any phenomena or processes based on their relationships and further integration. Based on the basic
definition of the system concept, we can say that it is an integrated whole, consisting of smaller parts that have certain features and characteristics. That is, system properties cease to exist if individual parts of the system cease to exist. Therefore, in our opinion, the system approach should focus not on individual components of the system, but on the principles of its construction and features of its management, which allow to build a rational strategy for finding ways to ensure adaptability and flexibility in the transformation period.

2. Critical literature review

The principles of building the economic system of the future through the view of the society in XXI century include the use of the theory of self-organization and self-reproduction. In other words, the system approach in the era of active transformational changes should acquire the features of self-organization, namely the ability to improve and modernize ("teach") quality characteristics, adapt, change the internal organization of the system. Adaptability becomes an extremely important feature of any economic system, allowing it to change the internal relationships in the process of functioning, to take into account the influence of internal and external factors, while setting limits for these processes [7, 8]. Thus, if in the above conditions the system does not acquire signs of adaptability, it can either degrade, or even cease to exist due to the inability to "learn", to intellectualize. In this context, we can highlight the following characteristics of the system:

- ability to avoid destruction and self-destruction;
- ability to improve organizational behavior (architectonics of formation and development of human capital);
- realization of opportunities for "learning" and innovation of all elements of the system, motivation for adaptation of human capital elements;
- the ability to flexibly change the organizational structure, to adapt to operating conditions;
- the ability to intellectualize in order to increase the efficiency of the system as a whole.

Based on the above provisions, it can be argued that theories that can be applied to economic systems are also quite acceptable to their lower-order subsystems. In this study the enterprise as a system comes to the fore. The movement of capital of all kinds in the enterprise, respectively, is subject to the general principles of systematization, which allows us to conclude that the managing sustainable development by human capital reproduction can also be considered as a subsystem of any enterprise.

Thus, S. Dyatlov gives an example with motivation as an element of human capital, which is important and necessary for the process of reproduction (formation, accumulation, use, replenishment, investment) of human capital was fully completed [9]. Based on the general laws of company’s capital movement, we consider the movement of human capital of enterprises in general.

The cycle of human capital in the framework of individual reproduction in successive stages is as follows (equation 1):

\[ M \rightarrow L(wf) \rightarrow P \rightarrow L' \rightarrow M' \]

(1)

where, \( M \rightarrow L \) (wf) - hiring an employee, or "selling" his human capital on the market in the form of rent;

... \( P \rightarrow L' \) - productive use of human capital, which embodies the actual realization of human capital of an individual by a particular enterprise, i.e. the creation by the employee of tangible or intangible goods (if it is services, works), which are in the form of goods;

\( L' \rightarrow M' \) - sale of goods or payment for services, works, which compensates the employee’s cost of human capital on the terms of payment stipulated in the contract of employment, and the owner of capital M - the cost of other factors of production, and creates additional income for the owner of capital (M*).

The process of reproduction and the cycle of human capital, which is constantly repeated in its entirety form its turnover. The turnover of human capital within the enterprise, which is considered as
a part of the total turnover, must meet the criteria of continuity, completeness and proportionality, which is achieved only in compliance of consumer and value assessment in the commodity markets of production factors, and also provides efficiency and adaptability of sustainable development of the company to global market transformations.

The process of company’s human capital reproduction extends to the labor market where the foundations for further sustainable development are laid through the use of potentially available labor resources (Fig. 1a and Fig. 1b). On this market the owner of capital hires an employee (carrier of human capital), stipulating in the contract working conditions and its payment. The unity of consumer and value assessment is achieved during the negotiations and determined by the situation on the labor market, as well as influenced by a number of economic and political factors that may affect the revision of the employment contract.

By signing a contract of employment, the employee becomes part of the total human capital of the enterprise. The unity of consumer and value assessment of human capital is achieved by recruiting such number of employees with appropriate qualitative characteristics, which would correspond to the part of working capital in cash, planned for the formation of the wage fund in proportion to the required volume of work. Proportionality is determined by the level of technology used in the production of goods or services by a particular enterprise.

The processes of monetary valuation of the cost of specific labor of workers through the categories of production costs form a productive stage of the human capital cycle in which its active consumption is carried out. In this case, the "consumption" of human capital is identical to the concept of "production" in the world of material things.

The next stage of company’s human capital reproduction is directly related to the sale of finished products (in cash), part of which goes to payment to the workers of the enterprise. The receipt of money on the company’s account allows the owner of capital not only pay wages to employees, but also form a fund of material incentives from the company’s profits in order to increase employee motivation to increasing productivity. The above sources form a single wage fund and is also a factor in intensifying the sustainable development of the company through the mechanism of material incentives for human capital.

In addition to the wage fund at the enterprise is also formed development fund, which is a direct source of company’s investment for training and retraining of personnel in connection with changes in internal needs, thus forming and developing the total human capital of the enterprise. The development fund is also a source of formation of "social capital", which in the expanded interpretation of the concept of "human capital" is part of it. With the help of social capital, a "corporate" employee is formed which is the carrier of intellectualized human capital and generates a managerial basis for sustainable development of the company.
Wages act as payment for a specific measure of the ability to work realization, measured in man-hours or any other quantitative and qualitative characteristics. That is, the remuneration of a particular carrier of company’s human capital can be considered as actually realized unity of consumer and value estimates of the real contribution of an individual employee to the prosperity of the enterprise.

In order to study the relationship between the above processes, it is advisable to use the Cobb-Douglas production function. Ukrainian industrial companies are known to actively use both financial and human resources, so they production volumes were forecasting based on the processing of statistical information presented on the official website of the State Statistics Service of Ukraine [10].

Taking into account the volume of output in monetary terms, capital of companies and labor, the following result was obtained (equation 2):

\[ y = 1.5438K^{1.4919252}L^{0.47397048} \]  

The resulting model was used to predict future values of production volumes based on expected levels of capital and labor. When using this model, the R-square (0.9915) is close to 1, which indicates the high quality of fitting the model, i.e. regression accurately describes the relationship between variables and the resulting indicator. In the obtained model, there is an increasing effect of scale, because the sum of \( \alpha \) and \( \beta \) exceeds 1 (equal to 1.9659). This means that if \( K \) (capital) and \( L \) (labor) will increase in a certain proportion, then \( y \) (the volume of output) will increase in a larger proportion.

It was found that on average during the analyzed period there was an annual increase in capital of industrial enterprises by 10% and a decrease in the number of their employees by 3%. Given these assumptions, we construct a forecast of production volumes for 2019-2022 (Fig. 2).

![Figure 2](image-url)

**Figure 2.** Forecast of production volumes produced by industrial companies of Ukraine using the Cobb-Douglas function, UAH million, 2019-2022

At the last stage of company’s human capital reproduction the money of individuals is exchanged for the conditions of existence necessary for them and members of their family for the purpose of support of vital activity. The unity of consumer and value estimates of living standards of employees is determined not by nominal but by real wages, which shows the level of real consumption and depends on the inflation component. Thus, in case of impossibility of employment, the state is subject to state social programs aimed at supporting the simple reproduction of human capital. Government subsidies in the form of unemployment benefits, disability benefits, etc. are allocated individual, households use them to purchase the minimum necessary goods and services.

### 3. Methodology and results

Managing sustainable development by human capital reproduction is a complex and multifaceted process that affects the formation of sustainable competitive advantages of the company, and cannot exist separately from its organizational behavior, which determines the overall vector of management
taking into account external and internal factors and features. At the same time, economics does not have a universal tool and conceptual apparatus in this area, for example, at the moment there is no single approach to defining the concept of "organizational behavior".

Quite often in the scientific works of leading modern scientists can be found discussions about the similarity of the concepts of "organizational behavior" and "organizational culture" [11-13]. Undoubtedly, these studies are important for a deeper understanding of the use of these concepts in relation to human capital, capable to intellectualizing economic activity at all levels, but requiring certain investments, both tangible and intangible.

Kwilinski A. works are devoted to various aspects of identifying the relationship between organizational behavior and development of the company, as well as individual elements of the corporate structure that affect the management process [14, 15]. Therefore, the peculiarities of organizational behavior directly affect the human capital reproduction of an individual, and, consequently, can affect the total human capital of the company.

Figure 3. The mechanism for managing sustainable development by human capital reproduction in the system of company’s organizational behavior
The mechanism for managing the company’s sustainable development by human capital reproduction in the system of its organizational behavior shown on Fig. 3, makes it possible to identify the importance of the competitive carrier of human capital as a generator of its intellectual component, as well as the priority of the unity of interests of participants in social and labor relations at all levels, which once again confirms the effectiveness of the application of a systematic approach when ensuring the unity of the organizational behavior of the enterprise, as well as the preservation of the foundations of the organizational culture.

Based on the stages of company’s human capital reproduction, considered in the first part of this study, in the structure of organizational behavior of the enterprise were identified personal, group and organizational levels. As part of this study and the formation of a mechanism for managing sustainable development by human capital reproduction in the system of organizational behavior of a company, we will also use these levels in order to highlight the competencies that should be inherent in certain carriers of the company’s human capital. Without ignoring the fact that the organizational behavior of an enterprise is based on the unity of the personal characteristics of an individual employee, the features of the organizational culture of the enterprise and the development of its communication network, we also propose to pay attention to the resources and environmental factors, without which the sustainable development of company is impossible, and, consequently, further maintaining the level of its competitiveness. When building a mechanism for managing sustainable development by human capital reproduction in the system of organizational behavior of a company, a systematic approach was applied, which is able to ensure self-organization and self-reproduction of this mechanism, both in the interests of an individual business entity and in the interests of developing the national economy.

4. Conclusions
This study, which included the application of a systematic approach to the managing sustainable development by human capital reproduction in the system of organizational culture of the company allows us to propose a number of priority measures to be implemented in order to intellectualize this process: 1) creation of a single team by identifying the abilities of potential workers to multifaceted modeling of economic and procedural situations; 2) material and moral support of individual carriers of human capital of the company during the whole cycle of its realization and after its completion; 3) motivational influence on individual carriers of human capital on the need for its reproduction and intellectualization; 4) ensuring integrated economic growth of the company by studying the strategies of managing the human capital reproduction of competitors and identifying positive and negative experiences that can be used to improve own management mechanism; 5) introduction of technologicalization of production activity, which will contribute to labor savings and its innovation, digitalization; 6) monitoring of human capital of the company in the system of its organizational behavior, identification of the reasons interfering reproduction of the aggregate human capital and their elimination; 7) ensuring the socio-economic effectiveness of the company’s human capital reproduction, compliance the unity of its renewal and use.

The implementation of the proposed measures throughout reproduction of human capital of the company will ensure the intellectualization of its socio-economic relations, forming a set of social relationships that through organizational behavior will contribute to achievement the mission of the enterprise, increase its competitiveness and ensure sustainable development in the economic environment.

References
[1] Becker G 1993 Human capital: theoretical and empirical analysis, with special reference to education (3rd ed.) University of Chicago Press https://doi.org/10.7208/chicago/9780226041223.001.0001
[2] Manuti de Palma P D 2014 Why human capital is important for organizations: people come first (1st ed.) Palgrave Macmillan: London, UK https://doi.org/10.1057/9781137410801
[3] Pekar V 2012 Human Capital of Ukraine 2025. Results of foresight
http://wikicitynomica.org/future/lyudskiy-kapitalukraini-2025-pidsumki-forsaytu.html
[4] Podra O P 2019 Development of the investment mechanism for the human capital reproduction under conditions of the information society Social-law Studios 3(5) 58–66
[5] The club of Rome 2018 A finer future. Creating an economy in service to life. A Report to the Club of Rome https://www.clubofrome.org/report/a-finer-future
[6] Dzwigol H 2019 The concept of the system approach of the enterprise restructuring process Virtual Economics 2(4) 46-70 https://doi.org/10.34021/ve.2019.02.04(3)
[7] Nelson D R, Adger W N, Brown K 2007 Adaptation to Environmental Change: Contributions of a Resilience Framework Annual Review of Environment and Resources 32 (1) 395–419 doi:http://doi.org/10.1146/annurev.energy.32.051807.090348
[8] Thompson J D 2003 Organizations in Action: Social Science Bases of Administrative Theory New Brunswick, New Jersey: Transaction, 222
[9] Dyatlov S A 1996 Teoriya chelovecheskogo kapitala: Uchebnoe posobie SPb.: Izd-vo SPbU EF 141
[10] State Statistics Service of Ukraine Available at: http://www.ukrstat.gov.ua
[11] Guiso L, Sapienza P, Zingales L 2006 Does Culture Affect Economic Outcomes? Journal of economic perspectives 3
[12] Alesina A, Dzhuliano P 2016 Kultura i instituty. Chast 1 Voprosy ekonomiki 10 84
[13] Gorodnichenko Y, Roland G 2010 Culture, Institutions And The Wealth of Nations National Bureau for Economic Research (NBER), Working Paper #163638, Cambridge 3
[14] Kwilinski A. 2018 Trends of development of the information economy of Ukraine in the context of ensuring the communicative component of industrial enterprises Economics and Management 1(77) 64-70
[15] Miśkiewicz R 2019 Challenges facing management practice in the light of Industry 4.0: The example of Poland Virtual Economics 2(2) 37-47 https://doi.org/10.34021/ve.2019.02.02(2)