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**IMPERATIVE OF HUMAN CAPITAL MANAGEMENT  
TRANSFORMATION IN THE DEVELOPMENT OF ECONOMIC  
SYSTEMS**

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***Abstract***

Human capital is the main factor of modern economic growth. As before, human capital is the strong point of Russian innovation system but the risk of decline in its quality and of “brain drain” is high. In terms of share of population with higher education and quality of school education Russia is at the same level as the leading world countries. Quality of university education is getting better; Russian higher educational institutions are strengthening their positions in certain subject ratings. At the same time, negative short-term dynamics in the development of high-tech and science-based types of activity (amid internal growth) and negative long-term dynamics in the development of information industry have been observed. Gap between Russia and benchmark countries in terms of share of science-based service sectors in GDP is higher than in terms of share of high-tech sectors of manufacturing industry. The authors have used classical methods of integrated and system analysis as well as specific research methods: the concept of comparative analysis that enabled to study factors of building up competences and formulate theoretical model of human capital transformation. The article demonstrates the need, the importance of changes in human capital management through transformation of higher university education, including in the field of industrial engineering. Trends for future human capital management for the period of 2017-2022 have been described. The authors have described the chronology of emergence of trends, problems and changes in the system of human capital management during the last six years – since 2012 to 2017.

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**Keywords:** Human capital, transformation, innovative development, new technological pattern.



## 1. Introduction

Since the end of XX century, such category as “human capital” has become widely used. American economists Theodor Shultz and Gary Becker were awarded Nobel prizes in economics in 1979 and 1992 respectively for developing fundamentals of human capital theory. At the first stage, the concept “human capital” included only knowledge and specialists’ ability to work. Afterwards, the concept of human capital was significantly extended.

According to Viktorova (2011), human capital is a growth driver for economy, society and family which includes knowledge, skills, abilities, work tools, life and working environment.

## 2. Problem Statement

In terms of the share of adult population participating in lifelong education, Russia falls behind foreign countries. According to poll called “Formation of lifelong education in Russia: analysis based on the results of Russian-wide polls among adult population of the country” conducted by Higher School of Economics (2017), about 30% of population aged 25 to 64 were involved in lifelong education in Russia during the last year. Well-educated and well-off people, as well as the youth are especially active. For the time being, those who are in real need of it are restricted in the access to lifelong education – that is those who have low level of education, do not work or hold low level job positions. It should be noted that among the key reasons for not taking part in lifelong education are not financial or time barriers but the absence of the formed need, conscious necessity in further education. There has been an outflow of highly cited scientists from the country. The difference between the impact factors of those leaving the country and those staying in it is one of the highest. In India and China the gap is also big, but the average impact-factor is higher. Russian scientists who left the country in 2013 had much higher (0.94) impact factor, which exceeds not only the average value of this indicator across the country (0.30) but also the typical for those scientists who come back from abroad (0.54) and for attracted foreign researchers (0.30) (Analytical statement, 2017).

The need and the importance of changes in human capital management through transformation of higher education, including personnel training in the field of industrial engineering, can be explained now by three axioms:

- Universities have to change because everything is changing. For the last 30 years Russia has changed more than any other western country, nevertheless, universities are still in the same situation as they were in the 70-s of the last century.
- Especially universities have to change because the world is undergoing now the so-called academic revolution.
- Russian universities in particular have to change first, because Russian system of education, including personnel training in the field of industrial engineering, is undergoing now the period of fundamental transformation.

## 3. Research Questions

In the authors’ opinion, the intention should be to transform the system of human capital management, not just to improve it (increase, optimize etc.).

The first thesis of the imperative of transformation is: when everything is changing, university shall change as well. Changes are status quo. Those companies that do not change do not develop, move forward to new results, new goals, new interactions; such companies are on their way to decline and, eventually, on their way to be replaced by other companies, on the way to organizational death. In order to promote changes in the field of higher education, universities shall realize that they should not only copy other universities but that they should be unique.

The second thesis of the imperative of transformation is: the university itself shall set unique goals and achieve them in its unique manner. In order to promote changes, each university shall find its own way, design their own set of intellectual results, unique set of academic results, unique contribution. Thus, changes as status quo and unique understanding of how to move forward mean that the university shall be constantly involved in change and adaptation cycles, cycles of refocusing on unique results.

The third thesis of the imperative of transformation is: rapid system transformations are needed (Savon, Zhaglovskaya, Safronov, & Sala, 2018; Zhaglovskaya, Savon, Safronov, & Sidorova, 2017). What should be noted about changes: changes do not happen at the academic speed. Academic speed is the idea of semesters, idea of academic calendar; all these ideas are the enemies of changes. They stop or slow down the changes or limit the impact that changes can make. The key element of changes is the speed of changes. The changes must be built on the presumption that there is a goal towards the achievement of which you work, there is a set of presumptions with which you work. And you start carry out the changes that must be carried out, and you implement changes as quick as possible, you can see if they work or not and make necessary adjustments. This is how the cycle “design – construction – changes” works. You are changing the academic structure, the academic culture and by doing so the university is becoming more sensitive to the modern world. In today’s world – the world of 2016, 2017, 2018 years - there is nothing similar to the world of 1970. That world ended. Most of our universities were conceptually designed at the beginning of 20th century and the idea itself arose in 16th century, the particular model was developed in 1960-1970. This makes it almost useless. What structures, what mechanisms, what companies, what institutes are now the same as they were in 1970? None. Banks have changed, other companies have changed, and production has changed. That is why the sector of higher education must decide on what we want to achieve, which unique goals we want to reach and by means of what tools we can come there.

The fourth thesis of the imperative of transformation is: system transformations require changes in academic patterns. Changes are necessary not simply for the sake of changes but for the sake of obtaining the possibility to move to perfection. It is neither easy nor trivial. It is necessary to gather people around the idea, to create something unique. In is necessary to design university in such a way that will enable to express that uniqueness and to adapt to its context. This is the obligation of management and academic staff who shall work together in order to set such goals, to establish change processes and to make first steps.

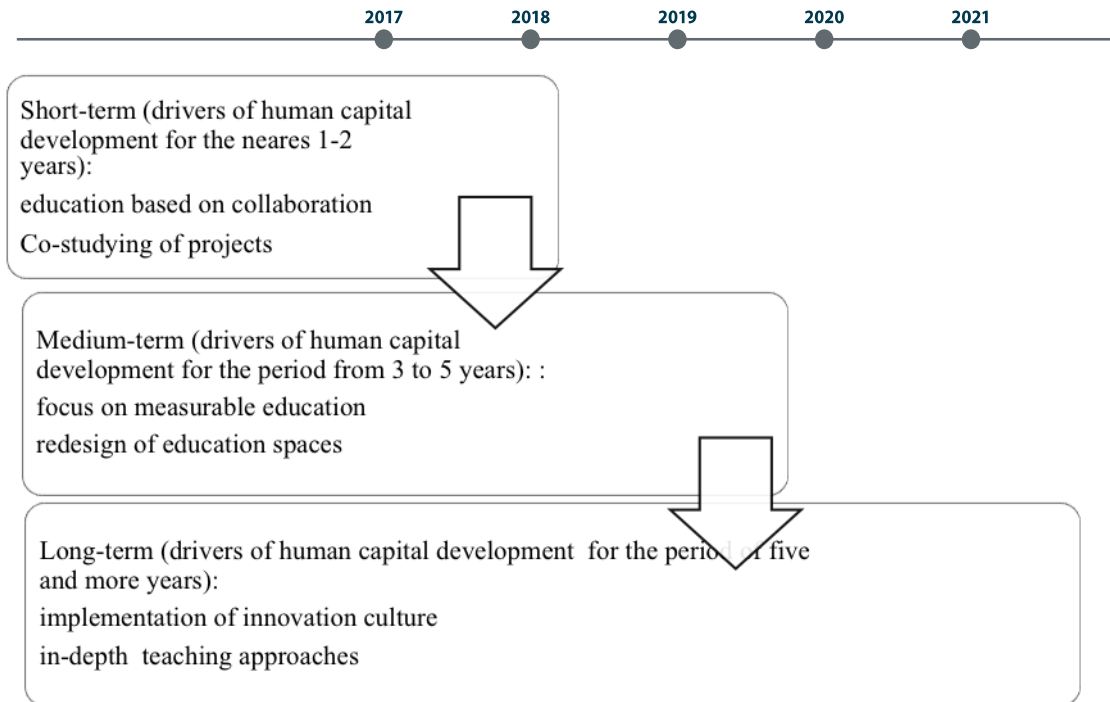
#### **4. Purpose of the Study**

The purpose of this article is to justify the need for transformation of the human capital in the context of new patterns of economic systems in Russia.

## 5. Research Methods

In their research the authors have used classical methods of integrated and system analysis as well as specific research methods: the concept of comparative analysis that enabled to study factors of building up competences and formulate theoretical model of human capital transformation.

Trends in development of human capital management, including personnel training in the field of industrial engineering, can be classified in accordance with the figure.



**Figure 01.** Drivers of development of the human capital in 2017 - 2022

Source of the figure: developed by the authors with the use of materials (Lewin & Cachanosky, 2018; Birasnav, Rangnekar, & Dalpati, 2010; Salim, Yao, & Chen, 2017; Lim, Updike, Kaldjian, Barber, & Cowling, 2018; Chatterji & Kiran, 2017; Fogel, Jandik, & McCumber, 2018)

Key trends of human capital management, problems, previous and forthcoming changes within the last six years are given in the table below. Monitoring of global trends is carried out among currently important courses of development of human capital management in particular field or at the intersection of fields. Trends are identified by means of analysis of scientific publications and patents and other foresight tools.

**Table 01.** Six-year horizon of trends, problems and changes in management of the human capital

Key trends	2012	2013	2014	2015	2016	2017
Co-studying of projects	✓	✓	✓	✓	✓	✓
Increased attention to measurement of education		✓	✓	✓	✓	✓
Promotion of innovation culture				✓	✓	✓
Redesign of education space				✓	✓	✓
In-depth teaching approach	✓				✓	✓
Collaborative studying	✓					✓
Evolution of remote education		✓	✓			

Reconsideration of previous opinion on teachers' roles	✓	✓				
Rapid increase in number of public educational resources		✓		✓		
Reconsideration of previous opinion on how institutions should work					✓	
Cross-university collaboration				✓		
Students as creators			✓			
Agile approaches to changes			✓			
Ubiquity of social media			✓			
Mixture of formal and informal education		✓				
Decentralized IT support	✓					
Lifelong education	✓					
Existing problems	2012	2013	2014	2015	2016	2017
Competition from new education models	✓	✓	✓	✓	✓	
Mixture of formal and informal education				✓	✓	✓
Improvement of digital literacy				✓	✓	✓
Integration of technologies into education	✓	✓	✓			
Customization of education		✓		✓	✓	
Preservation of relevant education			✓		✓	
Teacher's remuneration			✓	✓		
Absence of metrics for evaluation	✓	✓				
Need for radical change	✓	✓				
Reconsideration of previous opinion on teachers' roles						✓
Push to success						✓
Promotion of digital era						✓
Management of knowledge obsolescence						✓
Balancing of our connected and unconnected lives					✓	
Complex thinking teaching				✓		
Measuring of teaching innovations			✓			
Increase of access			✓			
Academicians' position towards technologies		✓				
Documenting and support for new forms of scholarship	✓					
Changes in education technology	2012	2013	2014	2015	2016	2017
Educational analytics	✓	✓	✓		✓	
Adaptive education technologies				✓	✓	✓
Games and gamification	✓	✓	✓			
Internet of things	✓			✓		✓
Mobile education	✓					✓
Interfaces of real users	✓					✓
Bring your own device				✓	✓	
Space designing				✓	✓	
"Clicking" class			✓	✓		
Transferable technology		✓		✓		
3D printing		✓	✓			
Tablet computers	✓	✓				
Artificial intelligence						✓
Next generation of LMS						✓
Emotional computers					✓	
Virtual reality					✓	
Robotic automation					✓	
Measuring of yourself			✓			
Virtual assistants			✓			
Massive open on-line courses		✓				

Source: prepared by the authors with the use of materials (Becker, 2017; Subramony, Segers, Chadwick, & Shyamsunder, 2018; Li & Wang, 2016; Roy & Shijin, 2018; Mutandwa & Genc, 2018; Pasban & Nojedeh, 2016)

## 6. Findings

Thus, when analyzing trends in future management of human capital (ChangeLab, 2018), including personnel training in the field of industrial engineering, it is possible to distinguish basic means for establishing a new system of human capital management with due regard to Russian specificity, a new system of human capital management compliant with future challenges (Shtrak, Dirks, Kotsis, & Mingardon, 2018; Tolstykh, Vertakova, Shkarupeta, Shishkin, & Krivyakin, 2017; Parakhina & Ustaev, 2018; Mikheev, 2018; Li, Kappas, & Li, 2018; Kurushina & Druzhinina, 2015; Paudel & Ryu, 2018; Sahasranamam & Nandakumar, 2018; Liu, 2017; Karapetyants, Kostuhin, Tolstykh, Shkarupeta, & Krasnikova, 2017):

- Creation of wide opportunities for acquiring necessary qualification during the whole working life of adult population.
- Creation of conditions for formation of key competences and for improvement of level of functional literacy of adult population.
- Elaboration of optimal strategies for marketing of higher and secondary professional education by means of research in the labor market with the view of identifying the most required professions and by means of research on the market of educational services and requests from consumers of such services.
- Formation of higher business education institutions (models University 4.0 and above)
- Promotion of international standards in education in their capacity of labor market requirements (4+2, PhD, tenure).
- Creation of system for stimulation of specialists' transition to science-based sectors of economy.
- Assistance in provision of information to participant of labor market (employers, employees, trade unions), governmental authorities, system of professional education concerning professions in demand in the labor market, having envisaged the inclusion thereto of new and promising professions in science-based sectors of economy.
- Establishment of Competences attestation centers.
- Clustering and netting of higher education institutions, business and professional communities on the basis of effective feedback from consumers through technoparks, innovation clusters where the leading higher education institutions act as anchor structures.
- Continuation of work on implementation of elements of dual education in educational process.
- Continuation of work on implementation of a new model of professional education management with organization of sectorial (supervisory) councils for personnel training in sectors of economy
- Formation of regional innovation and educational lift ensuring development of regional economy in the following areas: production and technological, scientific, cultural, personnel, consulting, innovation, information.
- Development of innovative entrepreneurship. Start-up establishment (acceleration).
- Support and development of remote forms of lifelong education (gamification (game technologies) in education; development of virtual tutors (virtual teacher 24/7) and mentor networks; implementation of artificial intelligence in the practice of lifelong education;

development of educational trajectories and wide distribution of massive open online course MOOC).

- Polarization of higher education into luxury (off-line) and massive (on-line)
- Creation of information service for support of adult population on the issues of education, development and attestation of qualifications in regions.
- Improvement of Internet accessibility for population in remote areas.
- Design and development of tools for monitoring of the system of lifelong education, criteria and indicators of quality of education for different categories of adults.

## 7. Conclusion

Being the domain of an individual person, the human capital is, at the same time, the public domain, the driving force for transformation and innovative development in the context of new technological patterns of economic systems.

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