Formation of modern requirements for the development of human capital in the context of increasing the efficiency of the industrial potential

V N Pulyaeva¹, A A Gibadullin², T J Usmanova³, I A Ivanova¹, E N Rudakova⁴ and O A Dmitrieva⁴

¹ Financial University under the Government of the Russian Federation, 49, Leningradsky avenue, Moscow, 125993, Russian Federation
² State University of Management, 99, Ryazan Avenue, Moscow, 109542, Russian Federation
³ The Technological University of Tajikistan, 63/3, N. Karaboev, Dushanbe, 734055, The Republic of Tajikistan
⁴ Russian University of Transport, 9b9, Obrazcova Street, Moscow, 127994, Russian Federation

E-mail: 11117899@mail.ru

Abstract. The study is devoted to the development of human capital in the context of increasing the efficiency of the industrial potential of the national economy. As part of the work done, factors affecting competitive advantage were analyzed, containing knowledge, technology, and a willingness to change. As a result of the analysis, it was revealed that Russia is not a leader in competitiveness, since the indicators of these factors are in low positions. The study stated that in order to achieve competitive advantages, it is necessary to use human capital, the mechanism of development of which can be training contracts, allowing employees to gain additional skills and new competencies that are further used in the implementation of their professional activities and the development of the company as a whole. In the end of the study the necessary conclusions are made.

1. Introduction

Currently, it is undeniable that the effective development of socio-economic systems is possible mainly with the dominant role of a person with his leadership potential, a wide range of knowledge, developed personal qualities, formed competencies, an active desire to develop and use professional experience and his unlimited intellectual resources [1]. Modern technologies, including artificial intelligence technologies, provide new opportunities in monitoring the human capital of an organization and managing the productivity of individuals. Thus, the relevance of the study determines the feasibility of determining the possibilities and prospects for the development of human capital in the conditions of maximum use of modern digital technologies [2-3].

Various aspects of the formation and development of human capital have been studied in numerous works of scientists. The theory of human capital, a significant contribution to the development of which was made by researchers from European countries and the United States, is now thoroughly replenished with the scientific contribution of Russian scientists. Many scientists actively carried out
theoretical and applied research devoted to various aspects of human capital management at different times [4-6]. In particular, the study of human capital in conjunction with intellectual capital is highlighted in the works of J. Kendrick, F. Mahlup, J. Mintzer, M. Malone, T. Stuart and others, as well as in the works of Russian scientists, such as S. Yu. Glazyev, A.A. Dynkina, S.A. Dyatlova, V.L. Inozemtseva, R.I. Kapelyushnikova, G. B. Kleiner, Yu.S. Kolesnikova, M.M. Cretan, I.I. Kuzminova, V.L. Makarova, V.A. Supruna and many others. The interrelation of innovative changes with human capital was considered in their works by S.V. Valdaytsev, Sh.M. Valitov, S.Yu. Glazyev, O.G. Golichenko, A.A. Dynkin, M.V. Nikolaev, M.P. Postalyuk, V.V. Radaev, L.N. Salimov, B.V. Salikhov, A.I. Tatarkin, A.F. Uvarov, A.I. Shinkevich, G. Shinstock and others.

The formation of the digital economy of Russia should take place according to certain rules, the management of which will achieve maximum economic and technological effects. The main directions of such an impact on human capital are the prevention, maintenance or elimination of the consequences of the manifestation of negative phenomena on the part of the management object, depending on their specific content [7]. In modern conditions, in connection with the active implementation of digital technologies in management practice, it became possible to solve these problems using new technologies.

2. Materials and methods

The aim of the work is to analyze the factors that determine the competitiveness of the economy and develop proposals for the management of human capital. The following tasks were formed in the work:

- identify factors affecting the competitiveness of the national economy and analyze their development;
- formulate recommendations for knowledge management.

The information base of the study was information from state, corporate, and analytical organizations. The study used descriptive, comparative, economic and statistical and logical methods, the authors relied on the achievements of such sciences as sociology, philosophy, economics, demography and management.

3. Results

In the international IMD rating “The 2019 IMD World Digital”, the places in which were allocated depending on the competitive advantages in the digital age and the degree of digitalization, Russia ranks 38 out of 63, rising two lines compared to 2018. The main factors that formed the basis of the assessment are knowledge, technology and future readiness, shown in figure 1 [8]. Let us consider these factors from the position of the international rating (figure 1) [8].

![Figure 1. Factors of competitiveness in digitalization.](image-url)

It can be seen from the figure 2 that detailing according to the level of knowledge and future readiness has a positive trend, and the indicator related to the level of technological development has not changed, which indicates stagnation in the development and lack of new technologies in the
national economy. At the same time, in the overall ranking, Russia moved from 41st place to 38th, which indicates minor changes in the development and competitiveness of the national economy.

![Figure 2. The general development trend of Russia and its detail on competitive factors.](image)

At the same time, it is worth noting that in the category of “knowledge” Russia has the best results and takes 22nd place, the “technology” factor is stable, small fluctuations occur over 5 years, but compared with 2018, the situation remained the same. In terms of “future readiness”, qualitative radical changes have occurred, which is reflected in raising positions by 9 points [9-12].

Consider each of the factors in which changes are observed in more detail.

The “knowledge” factor is also generalized and combines several characteristics. Table 1 [8] presents the trends in the knowledge factor in the dynamics of years, as well as its detail.

| Factor element          | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------------------|------|------|------|------|------|
| Talent                  | 36   | 37   | 35   | 40   | 45   |
| Training and education  | 19   | 17   | 14   | 12   | 9    |
| Scientific concentration| 23   | 26   | 25   | 23   | 18   |

Despite the fact that Russia has personnel with a high level of training, talent management can be described as the most problematic area in managerial activity. This indicator is lagging, and over the year, there was a shift of positions in the negative direction by 5 places, which is more due to a lack of international experience and a passive role in the globalization process, as evidenced by the analysis of this element.

Companies need to increase the level of international cooperation, attracting foreign specialists and gaining work experience around the world, because at the international level at 50 places there are such positions in the “talent” factor as “international experience”, “foreign highly-skilled personnel”, “management of cities”, the 42nd position is “digital/technological skills”. However, at the 21st and 22nd places is the positions “Educational assessment of PISA - Math” and “Net flow of international students”, respectively.

According to statistics, over the past year, it is the indicator of future readiness that showed the greatest growth, although before that it was lagging. The data of elemental analysis of the factor “future readiness” are presented in table 2 [8].

Elemental analysis reveals that it is the improvement in results with regard to business agility that has led to overall positive results. According to this indicator, Russia has risen in the ranking by 8
positions from the penultimate place. However, the flexibility of companies and the transfer of knowledge between employees remain the weak points of Russian business, as evidenced by the results of the analysis of business agility as an integrated one. For example, in the “agility of companies” position, the flexibility of Russian business is in the 60th position of the rating, the “knowledge transfer” position is in the 57th position, the “opportunities and threats” position is in the 46th position, and the “use of big data and analytics” and “world robots distribution” at 31 and 34 places respectively.

| Table 2. Elemental analysis of the factor "readiness for change". |
|----------------------|------|------|------|------|------|
| Factor element       | 2015| 2016| 2017| 2018| 2019|
| Adaptive attitudes   | 42  | 40  | 44  | 39  | 40  |
| Business agility     | 61  | 61  | 59  | 62  | 54  |
| IT integration       | 42  | 39  | 43  | 43  | 43  |

Thus, the analysis showed that the level of competitiveness of the national economy depends on three main factors - this is knowledge, technology and future readiness. At the same time, none of these factors showed breakthrough changes and did not reach the first positions in the ranking over the past five years, which indicates the need for the development of these factors in the context of increasing the efficiency of the industrial potential of the national economy [13-14].

4. Discussion

Peter Drucker noted that in the 21st century only the skill of self-learning would play a significant role, while other abilities will become obsolete and lose their significance in the present [8]. The desire of organizations to create a learning environment will ensure the creation of an internal creative atmosphere that is susceptible to creativity and innovation, contributing to the effective use of staff potential [15]. Complex and multidimensional work on building external and internal communications aimed at the accumulation and use of knowledge in the organization covers a wide range of activities in the field of personnel management of both strategic and tactical nature [16].

Trends in business are changing rapidly, but often employees have irrelevant knowledge, since they were obtained in traditional educational institutions and cannot correspond to all the changes that have occurred in the modern world. However, according to statistics cited by BCG, only 6% of employees take the opportunity to improve their professional skills [17].

A necessary step to improve their professional skills is the development of training contracts that will contain profitable offers, both for the company and for employees, with the aim of further training and the acquisition of new professional competencies by the latter [17-18]. A training contract is a mutual agreement on professional development of employees in which the organization is obliged to provide all the necessary resources, and the employee is to carry out continuous training and apply the acquired knowledge in work. The main task of modern companies is to preserve and develop current talents; therefore, management is interested in attracting additional funds to ensure the learning process. In addition, training staff and improving their skills will help to reduce managerial costs, since often attracting one new employee is more expensive than training an old one. According to a study by the Society for Human Resource Management in the United States, employers spend about $4,129 on hiring one employee for a particular position in the company [19-21].

The reason for the employee’s interest in continuing education is high competition in the labor market due to the replacement of human labor with machine labor. According to research, more than 75 percent of Russia's population in 2019 have access to Internet technologies and are actively using them [22-26]. Over the next few years, it is expected that 133 million jobs will appear in return for the disappeared 75 million. 21st century technologies require employees to have a higher level of skills and additional knowledge that can be obtained through retraining and advanced training.

In the opinion of the authors of the study, it is necessary to provide for the following mechanism for the implementation of training contracts:
- Goal setting. The employee independently determines what skills he wants to develop and what knowledge he needs to carry out his work.
- The choice of strategy. The employee and his mentor (in this case, the lower level manager) are studying the possibility of developing the selected skills and drawing up an individual plan for the employee.
- Summing up the intermediate results. The employee and mentor evaluate the process of development and training, focusing on the growth of skills and their application in practice.
- Final score. Employee results are assessed by criteria such as skill application, learning ability, and personal growth.
- Official recognition of the results. An employee is awarded for developing skills in a way that is meaningful to him, using methods of both material and non-material nature.

Thus, thanks to the presented approach, the employee will be able to obtain not only additional skills, but also acquire new competencies that will help him in the implementation of his professional activities and ensure the development of the company as a whole.

5. Conclusion
The presented study was devoted to the analysis of factors determining the competitiveness of the national economy, and the formation of proposals for their development. The study examined the international competitiveness rating, which includes factors such as knowledge, technology and willingness to change, because of which it was concluded that there is an insignificant change in Russia's overall position in the ranking, but there are no breakthrough changes in individual indicators of the factor. The considered positions of the factors showed that individual indicators, although they have significant changes, however, this practically does not affect the overall rating. The basis for increasing efficiency and the transition to new technological modes is human knowledge, skills, which, according to the authors of the study, need to be developed through the mechanism of “training contracts”, so that company employees will receive additional skills as well as professional competencies to carry out their professional duties and the development of the company as a whole.

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