

Transformation of Labor Relations under the Conditions of Digitalization and Institutional Changes in the Pension System

Apenko S.N.

Department of Management, marketing and Commerce
Omsk State Transport University
Omsk, Russia
apenko@yandex.ru

Kiriliuk O.M.

Department of Management, marketing and Commerce
Omsk State Transport University
Omsk, Russia
olgaomgau@yandex.ru

Abstract—This article is related to the transformation research of social labor relationship under the conditions of digitalization and institutional changes the pension system. The authors suggest a regulatory model of transformations of the system components of social-labor relationship in conditions of digitalization and pension changes based on a balance of interests of participants in social-labor relationship. The results of the reported research could be a methodological base for the transformational regulation of the social-labor relationship in any organization as well as could be recommended for each interested specialist in social-labor relationship.

Keywords—social-labor relationship, regulatory model of social-labor relationship transformation, digitalization, digital transformation, pension changes.

I. INTRODUCTION

Economic development nowadays is distinguished by high dynamics in the Information and Communication Technologies as well as digitalization in Russia and other countries. Thus, the BCG company in its researches has defined [1] modern conditions as “constant transformations era” talking in fact about continuousness of the transformation processes which are noted in social-labor relationship.

Transformation processes from the authors' point of view, can be explained by the technological determinism (including digitalization) and institutional changes. It finds the reflection in the research of the University of Oxford Carl Benedikt Frey and Michael Osborne, who are concerned that about 47 % of work places in the USA highly likely will be replaced by machines within coming 10 – 20 (Frey, Osborne, 2017) [2]. Similar research in Russia and other countries submit the conclusion about influence of the technological determinism and digitalization on the transformation in social-labor relationship (Arntz M., Gregory T., Zierahn U. (2016) [3], Sorgner A., Bode E., Krieger-Boden C. (2017) [4], Chang J.-H., Huynh P. (2016) [5], Dengler K., Matthes B. (2015) [6], Pajarinen M., Rouvinen P., Ekeland A. (2015) [7]).

Legchilina E.Y.

Department of Management, marketing and Commerce
Omsk State Transport University
Omsk, Russia
legcelena@yandex.ru

Tsalko T.V.

Department of Management, marketing and Commerce
Omsk State Transport University
Omsk, Russia
bt_tv@mail.ru

It is worth noting that the calculations conducted in the research are based on the aggregated index of employment, therefore there are some questions arise whether the expected perspectives of workplace digitalization can be connected with changes in the labor relationship and professional mobility on the individual level, if yes how close are they connected.

On the other hand, the dynamics of the economic processes also leads to some institutional changes in labor relationship. Thus, they actively discuss in the Russian economic society influence of the pension changes on the social-labour relationship. Equivalent problems are discussed in the scientific environment of other countries [8].

The problem is now becoming ever more relevant because:

Firstly, of the growing role of the human factor in economic processes;

Secondly, technological development has led to some changes in the content and the structure of the labor activity, work processes (growth of the intellectual labor). The attitude to the labor is being modified (labor values) as well as to the staff (as company asset and values). The reported tendencies have contributed to the spreading of new flexible forms of the social-labor relationship (in sourcing, outsourcing, freelancing, crowd sourcing);

Thirdly, the annual growth of the level labor pensions ahead of the average salary growth and incoming pension taxes;

In the fourth place, demographical transfer connected to the length of live, changes in lifestyle and the population ageing have led to the growth of the senior citizens which has an influence on a long term stability of the pension system.

Moreover, problems of the labor force of the retirement and pre-retirement age, attitude to the labor process of the younger and senior generation in the conditions of digitalization and pension changes, increase of the workforce

efficiency and distortion of the labor behavior in general lead to the transformation of the value formation not only of one person but a company (organization, entrepreneurship, society) as a whole. Due to some intrinsic reasons the circle of subjects (participants) of the social- labor relationship widens especially in the frames of pension changes (the transfer from the subjects of the social labor relationship → to stakeholders of the social-labor relationship) which preconditions the growth of the regulation (institutionalization) of the stakeholder collaboration. The necessity of the transformation research in the relationship between the labor and the capital arise respectively in the frames of new institutional and value-based space.

The research and monitoring of the social- labor relations in the contemporary conditions conducted by the authors have shown a vast variety and non homogeneity and incoherence in social-labor relationship in the modern-day step.

On the one hand, the development of technologies (including digitalization) provide huge possibilities in relationship between a worker and an employer, some distant (remote) operations become possible. Such circumstances demand certain flexibility and professional mobility from the staff. Moreover, permanent monitoring of the vacancies on the head hunting sites has revealed that 95% of the employers impose requirements to the age up to 40 years; more than 50% of the vacancies impose requirements to digital scope of competence.

On the other hand, the pension change increases employable workable return which can influence the growth of unemployment and lower the quality of life. In this regard all the changes happening in social-labor relationship lead to inevitable repugnancies having a negative effect on the motivation of the labor activity and behavior of the social-labor relationship participants and following misbalance of interests as well as to the opportunism growth among the staff and the employers.

The outlined problems and repugnancies actualize theoretical and methodological necessity of the common coherent and consistent approach explaining the influence of the social-labor relationship transformation on the quality of life of the citizens and economic growth in frames of the pension value-based changes based on the methodology and balance of interests of the participants.

The object of the reported article is the regulatory mechanisms research of social-labor transformations in conditions of digitalization and institutional changes in the pension system.

II. MATERIALS AND METHODS

The basis of this study is presented by the works of the foreign and national scientists in the field of social-labor relationship. The authors conduct the research based on the complex and systematic inter-discipline approach, considering social-labor relationship through the interdependent assembly of its components (institutions, values, labor processes, worker, relationship) having co-evolutionary dependence (figure 1).

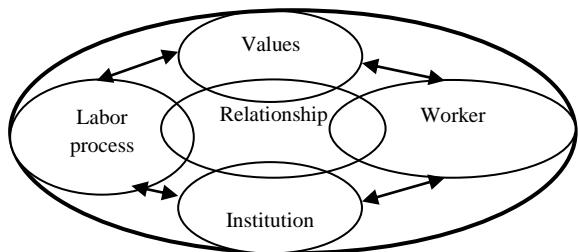


Fig 1. Main structural components of the social-labor relationship: « labor process – institutions – relationship – worker - values » (by author).

The hypothesis of the study was based on the fact that transformation of the social-labor relationship system was explained by the influencing group of factors «Hi-Tech – Hi-Hume» as well as some institutional changes in the pension system, growing repugnancies in the existing system of the social-labor relationship, leading to some misbalance of interests the social-labor relationship participants. The transformation itself happens through some fundamental changes in the system components of the social-labor relationship with co-evolutionary dependence. The driving force of the social-labor relationship system transformation are some institutional-axiological components (institutions and values) defining a transformation period and a new system of the social-labor relationship [9].

Under «Hi-Tech – Hi-Hume» the whole complex of the high technologies («Hi-Tech») is meant [10], (including informational, scientific and multifunctional, multipurpose technologies etc.) and high socio-humanistic technologies («Hi-Hume») [11], (including social technologies, technologies of the relationship and mega technologies etc.). From the authors' point of view, development of the «Hi-Tech» and «Hi-Hume» technologies and institutional changes in the pension system lead to the chain reaction of the transformations and changes in the value system, institutions, forms of relationship directed to the development (change) of the worker and buildup of effective relationship systems, values and institutions in the frames of labor process aligned with high technologies. Therefore, «Hi-Hume» technologies are oriented to the buildup of the certain stake holders' behavior (participant of the social-labor relationship), their relationship and actions taken within the labor process through the controlled influence on the value-based institutional sphere. In this regard, the influence of the group of «Hi-Tech – Hi-Hume» factors on the institutional changes in the pension system lead to repugnancies in the economic system and in the system of the social-labor relationship. Thus, the digital development demands from the personnel new knowledge, high flexibility, mobility, new forms of labor relationship etc., whereas the institutional changes in the pension system are referred to the maintenance of the traditional forms of the social-labor relationship and workers of pre-retirement age, who are of less demand on the labor market due to less digital competence, mobility and flexibility an need training. In a point of fact so called “digital transfer” or “digital transformation” of the social-labor relationship is considered, which means total replacement of analog technical, technological systems by digital information technologies, defining their wide implementation into the social-economic

sphere. According to the authors, digital technologies can be considered as a group of factors «Hi-Tech – Hi-Hume» contributing to the transformation process in the social-labor relationship.

Therefore, considering of the transformation regulatory questions within the system components of the social-labor relationship seems to be relevant. The system of the social-labor relationship, being constantly influenced by the outer and inner factors must contain regulatory mechanisms oriented to balance of interests of the social-labor relationship system participants.

The empirical analysis has been conducted on the base of the research data (questionnaire-based survey), performed by the authors in Russia within the study supported by the Russian fund of fundamental research (scientific project №19-010-00362) on representative selection.

Its results testify the expectation influence of the work places digitalization and the realization of the pension system changes on the probability of changes in the labor status including readiness to study (refresher course), job change, lost of job or demotion.

III. RESULTS

Figure 2 represents a regulatory model of transformation in the system components of the social-labor relationship based on axiological collaboration (value-based relationship) of the participants, building up value sub-systems «attitude to labor» → «labor behavior» → «labor efficiency». Our study has shown that the value-based relationships in the social-labor relationship system also change, acquire new modifications, and build up new connections between reasons and consequences of the component transformation of the social-labor relationship. In this regard the regulatory mechanism in the system of the social-labor relationship can be a result of institutional-axiological programming in the system of the social-labor relationship and connected to the results of the study of the transformation effectiveness analysis of the social-labor relationship, as well as interest balance achieving between the participants of the social-labor relationship. Such model includes five units («Monitoring of the social-labor relationship system conditions», «Technology level of the processes», «Competence level», «Institutionalization level», «Level of the value-based relationship») and suggests realization of the following steps:

1. To specify monitoring metrics and criteria designation of the social-labor relationship of the big economic system with regard to the objects, tasks and sector specific.
2. To choose of information collecting and analysis methods as well as decision making procedures about the necessity and content of the regulatory actions.
3. To specify selection criteria and specialists criteria (experts if necessary) for information collecting, accumulating and conducting of the social-labor relationship system condition.
3. To specify monitoring frequency and result presentation development of the social-labor relationship system.

4. To monitor the social-labor relationship system condition.

5. To make decision of regulatory changes in the social-labor relationship system components or its transformation.

Therefore, possible regulatory situations on changes in the social-labor relationship system can be presented by matrix-scheme (table I).

TABLE I MATRIX-SCHEME OF THE SOCIAL-LABOR RELATIONSHIP SYSTEM CONTROLLING POSSIBILITY

Possibility of changes regulation	Quick diffusion (adaptation) possibility of changes of the social-labor relationship system	
	Yes	No
Yes	(1) Full adjustability	(3) Problems of (adaptation) diffusion changes
No	(2) Part adjustability	(4) Full transformation is needed

Quadrant (1) shows an ideal situation with the possibility of full adjustability of the system components and a quick diffusion in the social-labor relationship system. Interests of participants are perfectly balanced.

Quadrant (2) characterizes a state when a part regulation of the social-labor relationship system is possible. Thus, a simplified personnel training cycle does not lead to the full buildup of the all necessary «digital competencies» etc.

Quadrant (3), describes a situation when diffusion ability to changes in the social-labor relationship system lowers which can probably demand some component transformation of the social-labor relationship system.

Quadrant (4) is characterized by the state when external factor influence cannot be controlled by the managerial impact and the included criteria do not help to evaluate the system condition and make a regulation of the social-labor relationship system.

Let us consider a reflexive regulatory model of changes in the social-labor relationship system on the digitalization, informational-communicative technologies and other innovative technologies (figure 2).

Considering transformation process reflection, regulation of changes in the social-labor relationship system components is seen by the authors as an uninterrupted process, determined by the liveliness and versatility of the ambient environment of each economic system revealing the need in state monitoring of the social-labor relationship system. Under the state monitoring of the social-labor relationship system the authors understand a complex information collection, processing, accumulating, analysis and interpretation system about the state of the social-labor relationship system. The target of monitoring is in-time information provision in order to regulate the social-labor relationship system state in the conditions of digitalization followed by building up of the system of measurement (Ex., metrics) and social-labor

relationship system effectiveness evaluation (for example how its aligned with new conditions) through the system components («labor process», «worker», «institutions», «values», «relationship»).

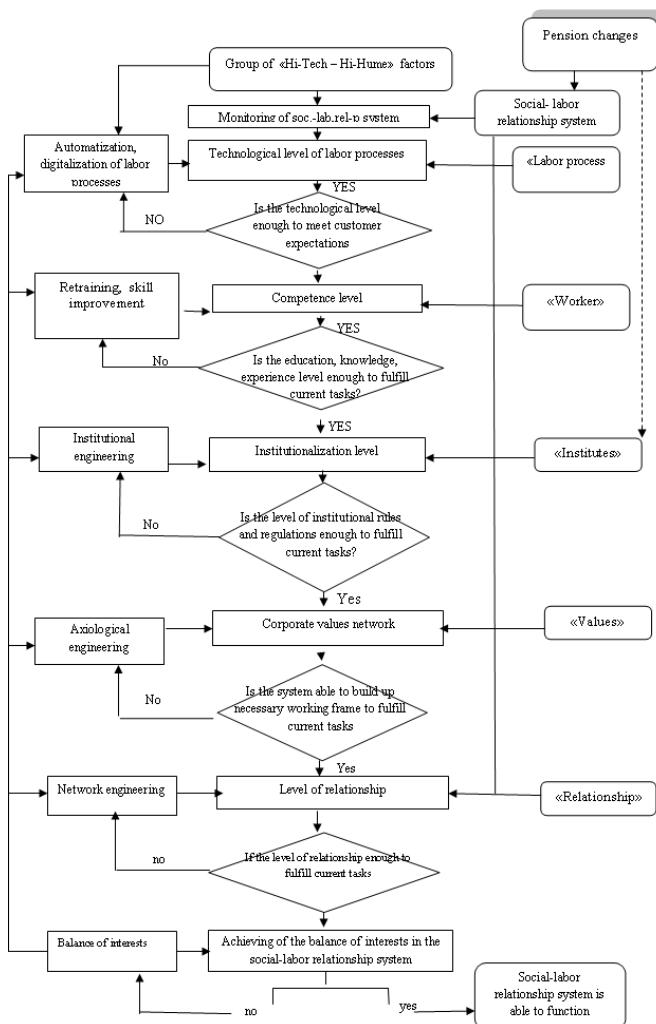


Fig 2. Transformation regulatory model in the social-labor relationship system.

Under the influence of the factors «Hi-Tech – Hi-Hume» the labor processes change dramatically (Ex., labor process automatization, labor digitalization), which demand changes in the labor processes. Hence, the need in the analysis and monitoring of the technological level of the labor processes arise with regard to the sector specific. The term «labor process technological effectiveness » is considered as the automation level of operations (works), done at the desks and defining labor, time material and financial resources optimization.

It is worth mentioning nowadays a big difference between labor processes technological effectiveness and operations: starting with high technological with use of digital means and finishing with simple hand processes and operations within one organization. Thus the influence of the factor groups «Hi-Tech – Hi-Hume» and labor process changes will differ. The mentioned aspects have been studied in the work [12], where

labor operations can be classified according to “sensibility” to the digitalization and automation: under standard and original labor operations. The standard operations (periodically repeating) and cognitive (including calculation) actions. Thus standard labor operations precondition digitalization and automation. Original labor operations are unlikely subject to automation due to the difficulty or impossibility to algorithm them. However, the research provided in the study [13], concerns the Artificial Intellect creation which can introduce automation into original labor operations. The mentioned trends lead to polarization of the internal labor market of the economic system, thus on one hand the growth of the working places can be pointed out which demands a high level of professional and abstract task solving (high qualified well paid workers), on the other hand, the number of the work places demanding simple hand operations grows or remains the same (low qualified low paid workers).

Labor processes in the social-labor relationship system must assure competitive edge of the company and economy due to the full and in-time satisfying the customers' requirements, at the same time providing a certain profitability level based on the certain sustainability. Thus the point of view of the authors is that labor processes technological effectiveness can be characterized by the workplace technological effectiveness. For instance, the wide digitalization development preconditions necessity of the changes the workplace technological effectiveness, what can be proved in research on the ripeness of technologies, conducted by the Gartner [14], which say that in the nearest future (in about 5 years) speech recognition technologies and virtual assistants will create a platform for digital workplaces. Moreover, digital technologies allow dividing the labor process in smaller operations. The digital work place can be considered as the complex of conditions necessary for the workplace and the capital collaboration, providing the possibility of working in the social-labor relationship system.

Therefore the common level of technological and labor processes in the social-labor relationship system can be analyzed for ability to provide competitive edge to the economic system. Thus if this conditions cannot be fulfilled and the level to satisfy the customer expectations is not enough it is necessary to change work processes, implement digitalization and automatization. If the level is in line, further the component «Worker» which is one of the most important components of the social-labor relationship system must be considered. This system component describes all workers abilities (physical and social-creative) in particular building up all the necessary competences to fulfill labor operations. Thus, to fulfill labor operations (work) in the current period in the frames of new labor processes certain knowledge, skills abilities are needed for instance a certain level of the digital competence. It means that not only in competence but labor behavior model in the workers mentality.

New digitalization technologies lead to dramatic changes in the competence structure building up some professional and digital competences.

Therefore, it is advised by the authors to conduct competence level diagnostic taking it as base comparison of

the actual necessary for the new (digitalized) labor processes. Thus by the labor processes digitalization it becomes necessary for the worker to acquire a certain set of “digital competences”. In case of mismatch of the actual competences for the current works it is necessary to regulate. Such can be for example some extra training, professional retraining, skill improvement or resource update. The reported sentence can be proved by a questionnaire conducted by the authors in 2019 among Russian citizens of the active working age in order to evaluate pension change influence level on social- labor relationship, economic growth and live quality.

Thus, 1102 respondents (90,2 % of the questioned) showed readiness to training and continue working when asked about the decision to save the social-labor relationship in case of new information technologies. 38 percent (3,1 %) of the respondents were ready to change workplace.

If the reported level corresponds (or is close to correspond) to fulfill current works, further must be considered the component «Institutes». Complex of the institutes regulations and rules providing new “labor processes functioning” which usage preconditions transaction costs cut down and optimize labor process providing total profitability growth of the economic system, building up institutionalization level in the social-labor system.

Thus, the labor process digitalization demands changes in the institutional space. Institutional nature of the labor process digitalization can be expressed in a complex of traditional collaboration norms between subjects participating in the digitalization of the social-labor relationship system. While labor process changes some new labor regulations needed, new work and rest schedules work proceeding regulations, changes in labor conditions, new guidance, regulations, new rules of conduct at the workplace, new safety regulations, job description amendments, new work contract, forms, for example, electronic work contract, work record book etc., meaning that the changes mainly deal with institutional instruments or means. From the authors point of view it is not about transformation of the institutes but about changes of institutional instruments. Thus in the digitalization process of the social-labor relationship «work contract» itself is not subject to changes as an institution, it can be signed in electronic form, which will allow cutting transaction costs. On the other hand, flexibility of forms in social-labor relationship grows (development of the “remote employment” etc.) and network forms of the social-labor relationship system broaden as follows it demands institution transformations and the system as a whole.

Thus, the pension changes demand some changes in institutional room of the social-labor relationship system, including amendments into collective work contract, institutional training mechanisms of the pension and employable age.

Empiric research conducted by the authors has shown institutional changes in the labor sector. Thus within the pension changes labor relationship and (or) labor relationship have changed in 40,1% of cases. 231 respondents (72,7%) have not noticed any changes of social-labor relationship (figure 3).

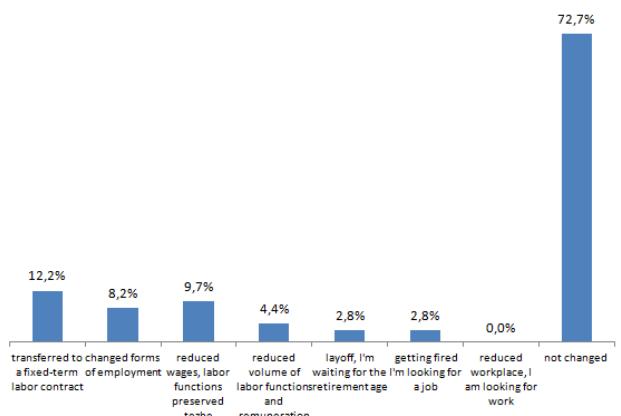


Fig 3. Institutional changes of social-labor relationship in conditions of the pension changes.

Therefore authors suggest considering the regulation of the institutional changes in the social-labor relationship system in frames of institutional engineering mechanism as a co-evolutionary development process directed to build up of certain new unified rules and regulations which allow functioning in the social-labor relationship system in digitalization.

If the institutionalization level is enough (is going to be enough) to current work fulfillment, further is to consider the component «values».

«Values» are the base of the collaboration in the social-labor relationship system. The complex of the initial (values-objects) and instrumental values (values - ways) of the stakeholders in the social-labor system create a corporate values network which builds up «axiological equity» (value equity). Technological determinism and digitalization lead to the value changes that can be proved in the studies of different scientists. Thus, the work of S.P. Robbins there is a development process and value evolution presented depending on technology modification [15]. Therefore the value system undergo to some modifications according to the group of factors «Hi-Tech – Hi-Hume», changing subsystems of values «attitude to labor» → «labor behavior» → «labor effectiveness», building up a necessary motivation field and worker frame. Value changes are happening through the axiological engineering. During the value analysis definition of the preconditions of new values formation is of the high importance. Thus in the digitalization conditions one of the important values becomes professional education whereas values differentiate between intellectual and physical labor.

If the corporate value network is able to build the necessary labor frame to fulfill current works excluding or preventing workers opportunistic behavior further the component «relationship» must be considered.

In this context the relationship is to be considered as a system of traditional forms of connections and relationship existing and developing in the social-labor relationship system based on the value exchange. Therefore, one can examine relationship in the context of axiological cooperation (value-based relationship). The influence of digitalization processes

on the relationship between stakeholders their concept does not undergo any changes rather the mechanisms and forms of interaction between stakeholders in the social-labor relationship system.

One should pay attention that regulation of one component in the social-labor relationship system is not possible without changing of another.

From that point of view the social-labor system is enabled to function effectively in the current period under the condition that interests of the social-labor relationship system participants is balanced.

IV. CONCLUSION

The study has shown that new and developing technologies in the future will lead to the revolutionary transformation of the social-labor relationship system and labor markets.

As it follows some concerns appear that the digitalization of work place and pension changes can lead to the workplaces abolishment and unemployment increase.

The article mentions new data on digitalization and new pension changes influence on individual occupational mobility. It has been revealed that changes in the labor sate become more likely against pension change digitalization. Above all it appeals to risk of job lost, make a step back on the career ladder or change occupation which is according to the respondents perceived in the nearest future. The given surveillance in general aligns with the predictions made by foreign scientists in their studies.

The empiric results reported in the article show readiness for such a step. Nevertheless, some extra study is needed in order to develop educational strategies aimed at protection of preretirement and retirement age workers from the consequences of the production digitalization and pension changes.

The authors developed and suggested the transformation regulatory model in the social-labor relationship system components based on managerial mechanisms and aimed at solving the outlined problems, as well as achieving the social-labor relationship system participants.

Acknowledgment

The reported study was funded by RFBR according to the research project № 19-010-00362.

References

- [1] J. Hemerling, D. Dosik, Sh. Rizvi, "A Leader's Guide to "Always-On" Transformation", BCG, November 9, 2015, [e-source] <https://www.bcg.com>.
- [2] C. B. Frey, M. A. Osborne, "The future of employment: How susceptible are jobs to computerisation?", Technological Forecasting and Social Change, vol. 114, pp. 254-280, 2017.
- [3] M. Arntz, T. Gregory, U. Zierahn, "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis", OECD Social, Employment and Migration Working Paper, № 189, Paris: OECD, 2016, [e-source] <http://dx.doi.org/10.1787/5jlz9h56dvq7-en>.
- [4] A. Sorgner, E. Bode, C. Krieger-Boden, "The Effects of Digitalization on Gender Equality in the G20 Economies", Kiel: Kiel Institute for the World Economy, 2017.
- [5] J.-H. Chang, P. Huynh, "ASEAN in Transformation: The Future of Jobs at Risk of Automation. Bureau for Employers' Activities", Working Paper № 9, Geneve: Internaltional Labour Office, 2016.
- [6] K. Dengler, B. Matthes, "Folgen der Digitalisierung für die Arbeitswelt. Substitu-ierbarkeitspotentiale von Berufen in Deutschland", IAB Forschungsbericht, Nuremberg: Institute for Employment Research, 2015.
- [7] M. Pajarin, P. Rouvinen, A. Ekeland, "Computerization Threatens One-Third of Finnish and Norwegian Employment", ETLA Brief № 34, Helsinki: Research Institute of the Finnish Economy, 2015.
- [8] J. Stalebrink, "Public pension funds and assumed rates of return: an empirical examination of public sectordefined benefit pension plans", American review of public administration, № 1(44), pp. 92-111, 2014.
- [9] L.W. Bezzubko, E.W. Nekhoda, "Social-labor relationship: study results in Russia and Ukraine", 2013.
- [10] E. A. Zhukova, "Hi-Tech: phenomenon, functions, forms", Tomsk State Pedagogical University Publishing, 2007.
- [11] E. A. Zhukova, "A man in captivity Hi-Hume", Tomsk State Pedagogical University, Bulletin, vol. 11 (74), pp. 29-35, 2007.
- [12] D.H. Autor, F. Levy, R.J. Murnane, "The Skill Content of Recent Technological Change: An Empirical Exploration", Quarterly Journal of Economics, vol. 118, № 4, pp. 1279-1333, 2003.
- [13] E. Brynjolfsson, A. McAfee, "Race Against the Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy", New York: W. W. Norton & Company, 2014.
- [14] "Gartner Hype Cycle for Emerging Technologies", Tadviser, 2019, [e-source] <http://www.tadviser.ru/index.php>.
- [15] S. Robbins, "Organizational Behavior", USA: Prentice-Hall, 1998.