

Attractiveness of the Megaproject Labor Market for Metropolitan Residents in the Context of Digitalization and the Long-Lasting COVID-19 Pandemic

Mikhail Vinichenko¹, Sergey Barkov², Aleksander Oseev³, Sergey Makushkin⁴, Larisa Amozova⁵

Russian State Social University, Moscow, Russia^{1,4}
Lomonosov Moscow State University, Moscow, Russia^{2,3,5}

Abstract—The article aims to determine the nature of changes in the attractiveness of the labor market of megaprojects from the perspective of megapolis residents under the conditions of digitalization and the long-lasting pandemic of COVID-19. The paper develops a scientific-methodological and categorical-conceptual apparatus with the support of empirical methods with distance methods. The study shows that the attractiveness of the labor market of megaprojects has undergone certain changes for megapolis residents under the current conditions. The factors of the attractiveness of the labor market of megaprojects are of a stable nature in the minds of megapolis residents. The main advantage of the work is the identification of trends in the changes of the megaproject labor market and the relationships they have. The study reveals both general and private trends. The obtained results can be used for further study of the megaproject labor market and the improvement of the social policy of the state and megalopolises in the conditions of digitalization and the prolonged pandemic.

Keywords—Megaproject labor market; metropolitan residents; digitalization; COVID-19 pandemic; attractiveness factors

I. INTRODUCTION

The fourth industrial revolution (4IR) and the digitalization of all spheres of life are conceptually changing the structure of the labor market and the system of socio-economic relations. The more rapid the digitalization, the more contradictions arise and the greater the resistance from certain segments of society. The complexities associated with the COVID-19 pandemic are added to this tangle of contradictions. The world economy is undergoing structural changes with an emphasis on mass digitalization and remote forms of employment. The global recession hits small and medium-sized businesses the hardest, service businesses suffer losses [1]. Transforming the market for goods and services, the introduction of artificial intelligence reduces customer confidence, worsens the labor market [2], and furthers social inequalities. The coronavirus pandemic worsens the plight of workers, increases their dependence on employers and the digital environment.

Megaprojects are implemented under special conditions. Recently, large projects are mainly social and concern water supply, social housing [3], and infrastructure development. Their effectiveness in a digital environment depends on the

management system that is created [4, 5], the adopted decision-making procedures, timing forecasting technologies [6], risks, and funding procedures. With weak management, megaprojects threaten regional ecology [7] and local communities [8] and conflict with the Sustainable Development Goals (SDGS). Amid the COVID-19 pandemic, several projects aim to curb the dangerous virus, while others try to make super profits by degrading the environment and the living conditions of the population. Such approaches adversely affect the labor market of megaprojects.

The introduction of digital services and artificial intelligence into the sphere of human resources (HR) only partially compensates for the effect of negative factors on the labor market. Innovative technologies based on digitalization contribute to the development of social partnerships [9], especially in megapolises. Young people find themselves in a contradictory situation. On the one hand, they are the most adapted to digitalization, constant change, and the application of themselves in new areas of business. They easily enter the labor market with the help of social networks, quickly obtain information about all kinds of changes. Young professionals change their views on employment in the international labor market, on the forms and content of work itself [10], their behavior in the workforce. Under these conditions, it is necessary to develop mechanisms to attract the attention of young people, to improve their motivation [11], and to create favorable working conditions for entering megaprojects [12]. Higher education [13] and the role and professionalism of recruiters are growing in importance. IT professionals are in a better position, as the demand for them is only growing in both megaprojects and megapolises.

At the same time, in the context of the pandemic, it is difficult for young professionals to compete with experienced workers in large companies who have earned the trust of employers and have a strong hold on their jobs. While at the beginning of the pandemic, it was mostly young people who sought remote work, by the second year, more and more age-matched residents of large cities had joined the ranks. Unemployment in various sectors of the economy is growing, which to some extent encourages young people and experienced workers to seek jobs in megaprojects in remote areas.

The acuteness of the problem of providing megaprojects with personnel has not yet led to the development of a precise method for promoting the attractiveness of the megaproject labor market among megapolis residents. This process is further complicated by the prolonged COVID-19 pandemic. The present paper may become an element in the system of measures to improve the effectiveness of megaprojects by means of competent and technologically advanced provision of the workforce for them with a focus on megapolis residents.

II. MATERIALS AND METHODS

A. Design and Hypothesis

The present study is part of a research project and the next stage in identifying the nature of the impact of the digitalization of the economy and the use of artificial intelligence on the social environment and labor market in general [14], and on the labor market of megaprojects in particular. The peculiarity of this work is that it takes into consideration the impact on the labor market of such a negative factor as the limitations of the pandemic. The work develops a scientific-methodological and categorical-conceptual apparatus, which allows achieving the goal of the study by solving scientific problems. The study puts forward hypotheses and develops a set of approaches and methods in the combination developed specifically for this study. The research team is formed with a specific allocation of tasks and functions, the order of the research is determined. The priority of the research team is the observance of scientific ethics in conducting the research.

The goal of the study is to determine the nature of changes in the attractiveness of the megaproject labor market from the perspective of megapolis residents under the conditions of digitalization and the long-lasting COVID-19 pandemic. To achieve the goal, the following research objectives are set for the study:

1) To determine the degree of readiness of megapolis residents to enter the megaproject labor market in the context of the digitalization of society and the prolonged pandemic of COVID-19.

2) To reveal the essence of changes in megapolis residents' assessments of megaproject attractiveness factors.

The hypotheses proposed by the team of authors are as follows:

H1. The attractiveness of the megaproject labor market has undergone significant changes for megapolis residents in the context of digitalization and the long-lasting pandemic of COVID-19.

H2. Megapolis residents' assessment of the megaproject labor market is contingent on their sex, age, and sphere of work and is predictable.

The comprehensive study consists of two stages: the first stage lasting from January 10, 2020, to June 10, 2021, with a sample of n=719 people (2021.1) and the second stage from July 1 to December 30, 2021, with n=1098 (2021.2) people with a general population of n=12'500'000. The sampling error is 3.75% with a 95% confidence level for the first stage

of the study and 3.5% with a 95% confidence level for the second stage. The main quota characteristics in the study when selecting respondents are gender, age, level of education, and work experience.

The decision to organize two stages of the study (two studies) is due to the possibility of differences in the views of megapolis residents at the start of the pandemic after a certain cycle of it and in the context of the prolonged pandemic, which has led to moral and psychological exhaustion, deterioration of health, pressure on the part of the government and the employer management, changes in the labor market, and the transformation of the structure of the market of goods and services.

Analysis of socio-demographic characteristics of the respondents (Table I) shows that in both studies, women are more active than men in almost the same ratio. It is natural both in view of the general ratio of the male and female population of the country and the higher activity of women in sociological surveys.

The age ratio of the respondents differs between the two stages to some degree. The proportion of metropolitan residents who participated in the sociological survey under the age of 25 has increased (from 67% to 76%). At the same time, the number of respondents under 18 years old has significantly increased (from 2% to 27%). Analysis of other age groups shows that the older generation, even among young people, is tired of numerous sociological surveys conducted on various occasions (health care, banking, political priorities...) by various state and commercial structures.

TABLE I. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS (IN %)

Characteristics of respondents		Share	
		2021.1	2021.2
Sex	male	31%	30%
	female	69%	70%
Age	14 - 18 years old	2%	27%
	19 - 25 years old	65%	49%
	26 - 35 years old	22%	18%
	36 - 55 years old	9%	3%
	56 - 65 years old	1%	2%
	over 65 years old	1%	1%
Level of education	higher	39%	15%
	incomplete higher	38%	35%
	secondary special	15%	18%
	secondary	7%	31%
Work experience	elementary	1%	1%
	1 year	26%	68%
	1-3 years	35%	20%
	4-5 years	18%	7%
	6-10 years	11%	2%
Nature of work activities	over 10 years	10%	3%
	executive	13%	4%
	specialist	48%	59%
	government official	11%	14%
	blue-collar worker	15%	12%
	self-employed	9%	8%
	unemployed	4%	3%

The age shift also affects the level of education. The share of respondents with higher education is significantly lower

(from 39% to 15%), while the group with secondary education has grown (from 7% to 31%). The latter are interested in discussing their future with the opportunity to participate in megaprojects as a mechanism of upward social mobility. The labor market itself, in turn, is in dire need of a great number of specialists with specialized secondary education. The provision of the market with highly qualified personnel is also a problematic issue.

Work experience in proportion to age has shifted toward one year. A significant reduction is observed in the number of managers (from 13% to 4%) and respondents with over four years of experience (from 21% to 5%). This suggests that experienced employees and managers have become less active in discussing their future in terms of participation in megaprojects. They are more comfortable working in their positions in the metropolitan city of Moscow.

B. Data Collection and Sample

The study is organized and conducted collaboratively by the Humanities Department of the Russian State Social University (RSSU) and the Department of Economic Sociology and Management of the Sociology Department at the Lomonosov Moscow State University (MSU).

The research methodology is based on the sequential use of a group of methods, beginning with empirical ones. The data obtained in the course of empirical research serves as a basis for statistical processing, systematization, comparative analysis, and discussion.

First, a questionnaire was prepared for a sociological survey, which underwent expert evaluation. The indicators are assessed using the Likert scale. The scaling went through five levels, from complete disagreement to complete agreement with the definition. Due to the pandemic restrictions, the sociological survey was conducted remotely using special programs (Google Form), cloud conference platform Zoom, and VoIP service Skype.

The cause-and-effect relations on the problems of selecting priority attractiveness factors and their antipodes are discovered in the course of in-depth interviews. The respondents for the in-depth interview are selected randomly. In the first study, the in-depth interview involves 18 respondents, in the second study – 21 respondents. The content and structure of the in-depth interview are developed taking into account the results of the conducted surveys.

Systemic conclusions to determine the nature of changes in the attractiveness of the megaproject labor market for megapolis residents in the conditions of digitalization and the prolonged COVID-19 pandemic are developed based on a focus group. The focus group consists of Russian and foreign experts in the field. In the first study, the focus group includes eight experts, and in the second study – nine experts.

In light of the changes in the social environment due to the digitalization of society in the context of the long-lasting COVID-19 pandemic, the categorical-conceptual apparatus on the issue is developed (finalized).

The term “megaproject” is composite. It refers to a set of projects that are aimed at achieving a specific goal,

interconnected by tasks, place, and time, and provided with the necessary resources. In this study, under the megaproject labor market, we understand the nature and totality of the supply of jobs by the composite employer uniting the set of organizations that offer jobs as part of a large project (megaproject) at all stages of its realization, as well as the totality of demand for those jobs by potential participants in the project. Due to the highest concentration of labor resources of different specializations and qualifications in megapolises, the paper will consider the possibility of their participation in the planned and ongoing Russian and foreign megaprojects. Digitalization of society is the process of introducing information and communication, digital technologies in all socio-economic structures and spheres of life. By artificial intelligence (AI), we understand intelligent computer programs, systems tasked with creating intelligent reasoning and actions. Sometimes, AI is designed to look like robots, including human appearance [15].

The attractiveness of megaprojects is determined by attractiveness factors, which include the most significant factors that ensure the desire (aspiration) of megapolis residents to participate in the megaproject. On the eve of the sociological survey, the expert group ranked the attractiveness factors to include them in the questionnaire. For this purpose, a matrix of pairwise comparisons is used. The sample consists of the 10 most significant factors, including such factors as gaining work experience in a large project, interest in communication with different people, opportunity to make a career, as well as receiving a good salary.

The draft of the survey is tested in a pilot study on the sample of the citizens of Moscow living in the Ostankinskiy District of the North-Eastern Administrative Okrug of the city. This study used the “snowball”, the respondents passed on the invitation to participate in the sociological survey through their social communication channels.

III. RESULTS

The study demonstrates that the ratio of megapolis residents willing to enter the megaproject labor market and participate in megaprojects remains the same. The greatest part of the respondents is to a certain extent ready to leave the megapolis (or stay in it) to participate in megaprojects (Fig. 1).

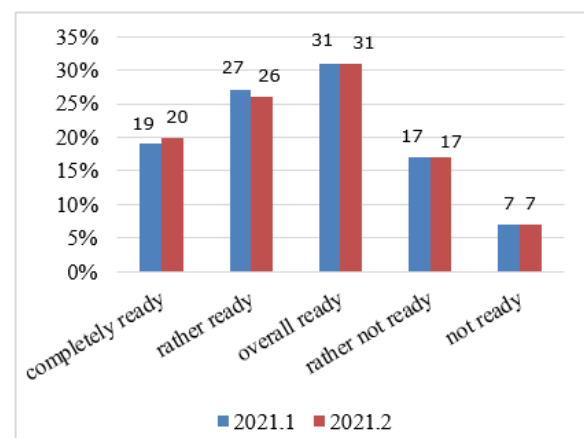


Fig. 1. Response Options to the Question, “Are you Ready to Offer Yourself in the Megaprojects Labor Market?” Source: Own Research, 2021.

It should be noted that the duration of the pandemic and the desire of the leadership to digitalize the private part of the people does not produce a significant effect on the position of megapolis residents. The share of the respondents completely ready to change the place of work (study) and take part in the megaprojects remains within 19-20%, and categorically refuse such opportunities the same 7% of the respondents. The rest of

the sample fluctuates between being partially ready or partially not ready to participate in megaprojects (57-58%).

The factors of attractiveness proposed for evaluation also remained approximately within the same limits of expert preferences. The changed conditions of the digitalization of society and the long pandemic have only partially changed the desires and aspirations of megapolis residents (Fig. 2).

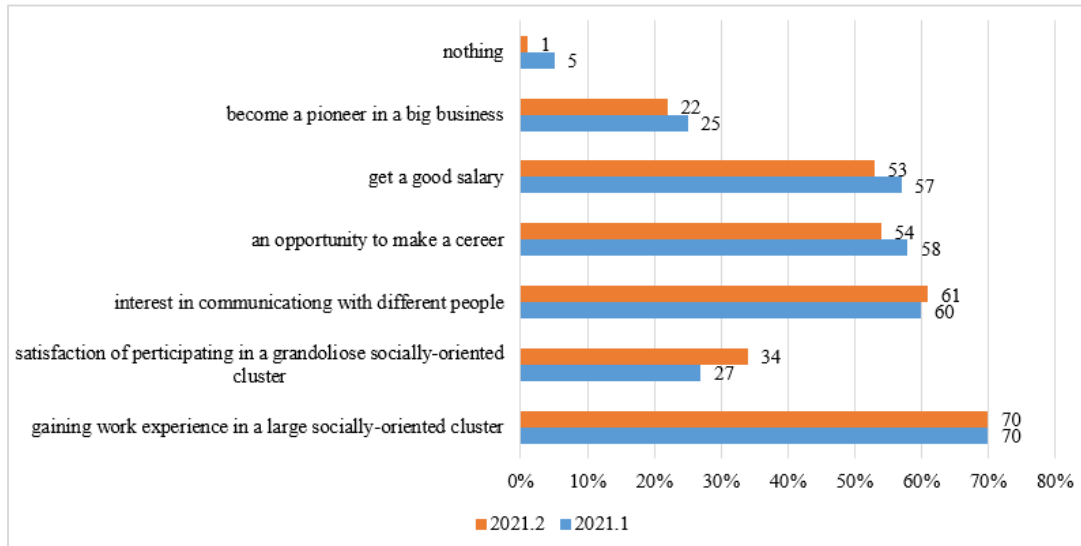


Fig. 2. Response Options to the Question, "What Attracts you most to a Megaproject?" Source: Own Research, 2021.

Among the leading **attractiveness factors** are the opportunity to gain experience working in a major project (70% of respondents), interest in interacting with different people (60-61%), the opportunity to make a career (54-58%), and getting a good salary (53-57%). Some changes are observed in the evaluation of the importance of other attractiveness factors. The importance of satisfaction with participation in a large megaproject is slightly decreased (from 34% to 27%). Total denial has increased with respect to the importance of megaprojects (from 1% to 5%), as well as of becoming a pioneer in a big business (from 22% to 25%).

At the bottom of the table of attractiveness factors, with less than 1% of the vote are the same factors, but with some changes in the values (Table II).

TABLE II. FACTORS WITH A LOW LEVEL OF ATTRACTIVENESS IN THE LABOR MARKET MEGAPROJECTS (IN %)

n/n	Factors of the attractiveness of a megaproject	%	
		2021.1	2021.2
1	Implementation of professional skills	0.1	0.1
2	If the company is international – the opportunity to communicate in a foreign language	0.1	0.2
3	Access to information	0.1	0.1
4	Any project is better than deployment in the army	0.1	0.2

At the same time, slightly higher is the importance of the opportunity to communicate and gain experience in a foreign language in an international company (from 0.1 to 0.2%) and to take part in a megaproject instead of serving in the army (from 0.1 to 0.2%).

In general, the study reveals the nature of the views of the residents of the Moscow metropolitan area on the megaproject labor market in the context of the digitalization of society and the prolonged pandemic.

IV. DISCUSSION

Comparative analysis of the sociological surveys reveals that the desire to enter the labor market of megaprojects generally remains unchanged among megapolis residents. However, taking into account changes in the age composition of respondents, their work experience, and professional skills, we can conclude that young people under 25 years old, mostly with secondary, specialized secondary, and incomplete higher education, are more favorable to megaprojects. They endured the pandemic digitalization with the least losses, being in educational institutions for the most part of it. The share of opponents of participation in megaprojects remains consistently small (7%).

The study also demonstrates a great number of those in doubt (over half of the respondents). This is explained by the instability of the situation: the economic crisis, the ever-changing restrictions, contradictory actions on the part of leadership to combat the COVID-19 pandemic, problems for small and medium-sized businesses, and increasing demands for skills and digital competencies on the part of employers. This group of respondents above all needs guarantees of the stability of employment in a big company in a decent position, as well as favorable working conditions. This is consistent with several studies [16].

The focus group experts are also sure of the hypothetical readiness of megapolis residents to enter the megaproject labor market under the condition of a high salary. This, however, applies mostly to young people with modest professional skills. Executives and highly qualified specialists will offer their services in this labor market reluctantly and involuntarily. Middle-aged and older respondents are least inclined to change the atmosphere of the Russian capital for dubious prospects in megaprojects. This is especially true for IT, logistics, and marketing specialists. These specialists were able to adapt to the constantly changing conditions and requirements of the megapolis administration and company management in the rich metropolitan labor market. They have developed several measures and implemented solutions to bypass (overcome) the next pandemic restrictions on movement, forced-voluntary vaccination, and remote labor and social activities. At the same time, they have the opportunity to partially or fully participate in megaprojects remotely, without leaving the megalopolis. The digitalization of the socio-economic sphere allows this to happen. This confirms the general **trend** of fragmented hypothetical desire and remote participation of megapolis residents in megaprojects.

Here it needs to be pointed out that a part of megapolis residents of various ages, being driven to despair by restrictions and oppression, openly and sometimes aggressively oppose such restrictions.

The in-depth interview reveals cause-effect relationships in determining the priority of attractiveness factors. The desire of megapolis residents to enter a new labor market to gain experience in a major project appears to be stable and strong. This seems logical for young people since, in the course of the pandemic, older workers have developed mechanisms for survival and retention of their positions. In megaprojects young professionals see an opportunity to rapidly develop their career, realize their creative potential, get a good salary, raise their social status, and get an opportunity to join a promising ambitious team. These findings correlate with several studies.

Work in a megaproject usually involves interaction with a large number of workers of different professions and areas of work. This arouses steady interest among megapolis residents. At the in-depth interview, they express their hopes to work with a good manager, in a favorable social and psychological climate with a friendly attitude to all employees regardless of their age, gender, social status, socio-ethnic features, and religious affiliation. The importance of these aspects in attracting and retaining employees in companies has been emphasized by various researchers [17, 18].

At the same time, in-depth interviews express concerns about entering the process of mass recruitment, the fear of "getting lost" in large teams, the difficulty of adaptation, especially on the part of talented young people.

The respondents' desire for good salaries is based on considerable and usually sustainable financing of large projects. This also implies high salaries in all positions of the megaproject. It should be noted that the concept of good wages among the megapolis residents differs significantly

from the views of the regional population. This acts as a deterrent to attracting megapolis labor resources to megaprojects. There is also a certain differentiation in the level of wages by age. For the majority of young people, the requests are lower than those of older age groups. These aspects are reflected in the works of researchers exploring the problem of personnel **motivation**.

The ambitiousness of work in the projects remains generally at the same level. For the most part, young people express their desire to be pioneers in the implementation of large-scale digital projects that would significantly advance the digitalization of the Russian economy. To a certain extent, the respondents point to the pandemic restrictions being lighter in the remote regions that could potentially become the site of the megaproject. However, these statements do not carry much meaning. Youthful enthusiasm, the desire to create the groundwork for a great career remain among the priorities.

The focus group experts conclude that in the second stage of the study, the main attractiveness factors have the greatest effect on the age group under 25 years old. This points to the emergence of a **private trend** of the decrease in age in assessing the effectiveness of the impact of the factors of the attractiveness of the megaproject labor market from the perspective of megapolis residents under the conditions of digitalization and the prolonged COVID-19 pandemic. At the same time, the results support the discovered **dependence** of the labor activity of megapolis residents in megaprojects on their age: the younger the age, the higher the communicability, labor activity, and readiness to relocate and change the place and conditions of work. This dependence was taken into account by the leadership of the Soviet state in the design and successful implementation of megaprojects.

The opportunities to apply professional skills in the megaproject and have access to its information remain in the zone of low demand. This is especially characteristic of young people who have only basic professional skills and limited work experience that had little to do with digital services and was rather a part-time job in the service sector in low-skilled positions, offline distribution of advertising. Focus group experts note young people's desires and simultaneous fears with respect to mastering new digital technologies and being socially secure. To some extent, this falls in line with the works of other researchers [10, 19, 20]. Somewhat higher is the share of proponents of communicating in a foreign language and military evaders. This comes as a result of the opportunity to gain greater career prospects by knowing a foreign language, as well as of a tougher approach to military personnel in the fight against the pandemic in the army.

Overall, it can be argued that there has emerged a common downward **trend** in the age of metropolitan residents willing to enter the megaproject labor market in the face of digitalization and the long pandemic of COVID-19.

V. CONCLUSION

The study establishes that the attractiveness of the labor market of megaprojects has undergone certain changes for megapolis residents under the conditions of digitalization and the long-lasting pandemic of COVID-19. This partially

confirms the first hypothesis. The essence of these changes lies in the plane of age and the sphere of work. The work confirms the dependence of megapolis residents' employment in megaprojects on their age revealed in the first stage of the study: the younger the person, the higher their communicativeness and labor activity, readiness to relocate and change the place and conditions of work. To a certain extent, this confirms the second hypothesis that megapolis residents' assessment of the megaproject labor market depends on gender, age, and sphere of work and has a predictable nature.

Attractiveness factors have not undergone major changes in terms of significance, which points to the validity of the conducted expert assessments and the stability of opinions of megapolis residents. Those megapolis residents having real opportunities to enter the rich labor market of the capital are steadily attracted to megaprojects by the opportunity to gain experience in a major project, the interest of communicating with different people, the opportunity to make a career, and a high salary.

The study reveals (proves) general and private trends. Among the discovered **general trends** are the reducing age of megapolis residents wishing to enter the megaproject labor market in the context of digitalization and the prolonged COVID-19 pandemic, as well as the trend of fragmented hypothetical desire and remote participation of megapolis residents in megaprojects. Of private nature is the **trend** of the reduction of age in assessing the effectiveness of the impact of factors in the attractiveness of the megaproject labor market.

The results of the comparative analysis may be of interest for further research on the peculiarities of socio-cultural and socio-economic life in the context of the long-lasting COVID-19 pandemic with the concentration of digitalization on individual social aspects (QR codes). Furthermore, the results of the analysis may be used in covering the staffing needs of emerging and existing megaprojects, to be attentive to people, and to improve the social policies of the state and megapolises.

REFERENCES

- [1] K. F. Zimmermann, G. Karabulut, M. Huseyin Bilgin, M., and A. Cansin Doker, "Inter-country distancing, globalization and the coronavirus pandemic", *The World Economy*, vol. 43, no. 6, pp. 1484-1498, 2020. <https://doi.org/10.1111/twec.12969>
- [2] Z. Tong, H. Chen, X. Deng, K. Li, and K. Li, "A scheduling scheme in the cloud computing environment using deep Q-learning", *Information Sciences*, vol. 512, pp. 1170-1191, 2020. <https://doi.org/10.1016/j.ins.2019.10.035>
- [3] A. Garay, A. Ruiz, and J. Guevara, "Dynamic evaluation of thermal comfort scenarios in a Colombian large-scale social housing project", *Engineering, Construction and Architectural Management*, vol. 29, no. 5, pp. 1909-1930, 2021. <https://doi.org/10.1108/ECAM-09-2020-0684>
- [4] E. Hetemi, A. van Marrewijk, A. Jerbrant, and M. Bosch-Rekvelde, "The recursive interaction of institutional fields and managerial legitimation in large-scale projects", *International Journal of Project Management*, vol. 39, no. 3, pp. 295-307, 2021. <https://doi.org/10.1016/j.ijproman.2020.11.004>
- [5] J. Larumbe, J. Garcia-Barruetaña, and D. Lopez De Ipiña-Gonzalez De Artaza, "Methodology for the implementation of configuration management on large scale projects", *Dyna*, vol. 96, no. 1, p. 13, 2021. <https://doi.org/10.6036/9806>
- [6] M. Gordon, D. Viganola, A. Dreber, M. Johannesson, and T. Pfeiffer, "Predicting replicability-analysis of survey and prediction market data from large-scale forecasting projects", *PLoS ONE*, vol. 16, no. 4, e0248780, 2021. <https://doi.org/10.1371/journal.pone.0248780>
- [7] M. V. Rybakova, M. V. Vinichenko, Y. S. Ushakova, O. L. Chulanova, S. A. Barkov, M. A. Malyshev, et al., "Ecological problems of Russian cities on the views of young people", *Ekoloji*, vol. 28, no. 107, pp. 5019-5026, 2019.
- [8] Z. Wang, R. Nixon, A. Erwin, and Z. Ma, "Assessing the impacts of large-scale water transfer projects on communities: Lessons learned from a systematic literature review", *Society and Natural Resources*, vol. 34, no. 6, pp. 822-843, 2021. <https://doi.org/10.1080/08941920.2020.1859029>
- [9] N. V. Medvedeva, E. V. Frolova, and O. V. Rogach, "Territorial public self-government and local government: Interaction and prospects for partnership", *Sotsiologicheskie Issledovaniya*, vol. 10, pp. 72-82, 2021. <https://doi.org/10.31857/S013216250015275-5>
- [10] T. S. Demchenko, P. Karácsony, I. Y. Iliina, M. V. Vinichenko, and A. V. Melnichuk, "Self-marketing of graduates of high schools and young specialists in the system of personnel policy of the organization", *Modern Journal of Language Teaching Methods*, vol. 7, no. 9, pp. 58-65, 2017.
- [11] O. L. Chulanova, O. L. Ryngach, M. V. Vinichenko, O. V. Kaurova, M. V. Demchenko, and T. S. Demchenko, "Increase of staff loyalty by improving the motivation (stimulation) system in enterprises oil and gas complex of the Khanty-Mansiy autonomous district - Ugra", *Modern Journal of Language Teaching Methods*, vol. 8, no. 8, pp. 303-314, 2018.
- [12] O. V. Rogach, E. V. Frolova, A. V. Kirillov, V. V. Bondaletov, and M. V. Vinichenko, "Development of favourable learning environment and labor protection in the context of harmonization of social interaction of educational system objects", *Mathematics Education*, vol. 11, no. 7, pp. 2547-2558, 2016.
- [13] E. V. Frolova, and O. V. Rogach, "Digitalization of higher education: Advantages and disadvantages in student assessments", *European Journal of Contemporary Education*, vol. 10, no. 3, pp. 616-625, 2021.
- [14] M. V. Vinichenko, O. L. Chulanova, M. V. Rybakova, S. A. Barkov, and M. A. Malyshev, "The impact of artificial intelligence on behavior of people in the labor market", *Journal of Advanced Research in Dynamical and Control Systems*, vol. 12, no. 4 (Special Issue), pp. 526-532, 2020. <https://doi.org/10.5373/JARDCS/V12SP4/20201518>
- [15] M. V. Vinichenko, M. V. Rybakova, O. L. Chulanova, S. A. Barkov, S. A. Makushkin, and P. Karacsny, "Views on working with information in a semi-digital society: Its possibility to develop as open innovation culture", *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 7, no. 2, pp. 160, 2021. <https://doi.org/10.3390/joitmc7020160>
- [16] M. V. Vinichenko, E. V. Frolova, E. E. Kabanova, M. S. Kozyrev, and T. A. Evstratova, "The youth employment problems", *Journal of Advanced Research in Law and Economics*, vol. 7, no. 2, pp. 378-387, 2016.
- [17] G. Nikiporets-Takigawa, "Youth and youth policy in the UK: Post-brexite view", *Sovremennaya Evropa*, vol. 1, no. 80, pp. 47-58, 2018.
- [18] A. A. Oseev, F. A. Dudueva, P. Karácsony, M. V. Vinichenko, and S. A. Makushkin, "The peculiarity of the ethno-social conflicts in the Russian labor market: Comparative analysis of Russia, Great Britain and Germany", *Espacios*, vol. 39, no. 22, p. 12, 2018.
- [19] E. Nkansah-Dwamena, and A. Bonnie Raschke, "Justice and fairness for Mkangawalo people: The case of the Kilombero Large-scale Land Acquisition (LaSLA) Project in Tanzania", *Ethics, Policy and Environment*, vol. 24, no. 2, pp. 137-163, 2021. <https://doi.org/10.1080/21550085.2020.1848187>
- [20] L. Zhongyuan, A. V. Melnichuk, S. A. Makushkin, M. V. Vinichenko, and M. A. Azhmuratova, "Social protection management: Anti-fraud technologies", *Journal of Advanced Research in Dynamical and Control Systems*, vol. 12, no. 4, pp. 1687-1693, 2020. <https://doi.org/10.5373/JARDCS/V12SP4/2020165>