

## Megapolis Residents' Readiness to Participate in Megaprojects Under the Conditions of the Digitalization of the Economy and the Use of Artificial Intelligence

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### Abstract

*The goal of the article is to determine and evaluate the readiness of megapolis residents to participate in megaprojects in the context of the digitalization of the economy and the use of artificial intelligence. The main empirical methods are a questionnaire survey, in-depth interviews, and a focus group conducted using distance instruments due to the pandemic-related restrictions. The study demonstrates that the readiness of megapolis residents to take part in megaprojects under the conditions of the digitalization of the economy and the use of artificial intelligence is ambiguous. Obtaining the necessary human resources is often critical for the organizers of megaprojects. For the first time, the authors identify the main factors of the attractiveness of participating in megaprojects for megapolis residents: the opportunity to get the experience of working in a large project, interest in communicating with different people, and the opportunities to make a career and get a good salary. The important factors also include satisfaction from participating in a grandiose megaproject and becoming a pioneer in a big business. The factors of negligible importance are the opportunities to implement one's professional skills and communicate in a foreign language in a foreign company, having access to information, and avoiding deployment in the army. The main advantage of the study is the systemic approach to evaluating the readiness of megapolis residents to participate in megaprojects, as well as the identification of the trends of the fragmentary and temporary readiness of megapolis residents for participation in megaprojects and the striving of young megapolis citizens to obtain new professional skills and abilities in megaprojects. Labor activity of megapolis residents in megaprojects is found to be contingent on their age. The obtained results can be used to improve the state personnel policy and the system for the formation of personnel potential in a megaproject.*

**Keywords:** Megaproject, Digitalization, Artificial Intelligence, Megapolis Residents, Attractiveness Factors, COVID-19 Pandemic.

## 1. Introduction

In the contemporary world, increased attention is paid to large-scale projects. Through these projects, the leadership of states and large companies seek to solve global problems and make great profits at the same time. Megaprojects typically have a social aspect to them. They are aimed at the development of social housing (Garay, A; Ruiz, A; Guevara, J. (2021), provision of drinking water (Liu et al, 2021), roadbuilding (Hetemi et al, 2020). Practice demonstrates that the success of such projects depends on a variety of factors including the organization of the megaproject (Hetemi et al, 2021), the quality of management (Mahmoudi et al, 2020; Larumbe et al, 2021), decision-making methods (Gao et al, 2021; Dreyer et al, 2021), the effectiveness of financing (Sampath et al, 2021), and competent prediction of the megaproject results (Gordon et al, 2021). Risk assessment is crucially important (Korytarova & Hromadka, 2021), especially regarding the risks stemming from excessive bureaucratization (Higginbottom et al, 2021). Failure to consider these factors entails the negative socio-economic effect of megaprojects on the regional infrastructure (Frolova et al, 2016) and the residents of the locations where large-scale transformation and work takes place (Aung et al, 2021). In the conditions of the digitalization of society and the introduction of artificial intelligence, this factor poses a threat to the strategies of not only development but the very existence of society (Wang et al, 2021; Nkansah-Dwamena & Raschke, 2021) and generates social and ecological risks (Fang et al, 2021; Rybakova et al, 2019). This is contradictory to the Sustainable Development Goals (SDGs) (Ridho et al, 2018; Kramarenko et al, 2020).

In the conditions of the COVID-19 pandemic, big businessmen, in addition to fighting against the dangerous virus (Schulte, 2021), propose megaprojects that aggravate the situation of indigenous people in several countries, as well as the environmental situation (Crimmins et al, 2021; Hofmann, 2021; Ushakov et al, 2018).

At the same time, a critical factor in the success of any megaproject is people. This becomes even more relevant under the conditions of the digitalization of the economy and the use of artificial intelligence in all spheres of life. The software of megaprojects depends on IT specialists who, in turn, require comfortable working conditions at all stages of their development (Rogach, et al, 2016). This is especially important at the stage of IT specialists' adaptation to the new global environment of a megaproject (Britto et al, 2020). In this context, it is critical to develop the competencies of working with large databases and digital media, as well as sharing experience in the online networking space

(Frolova et al, 2019). The development of the competencies of the future in engineering and IT specialists becomes the foundation of the success of any project, especially a large-scale one (Libin, 2020). It is also necessary to constantly advance the digital culture and digital literacy of the entire team of the project and individual organizations as more and more job functions are digitized (Khitskov et al, 2017).

All these aspects have to lie in the plane of the leading Russian and foreign specialists' striving to become part of effective megaproject teams. It is necessary to increase the attractiveness of a megaproject to promote the desire of leading specialists in the field to join the project team. This work has to be based on skillfully motivating the future employees (Karácsony et al, 2018; Chulanova et al, 2018). The competent work of recruiters relying on digital technology and artificial intelligence (Pomato, 2021; Unilever, 2021) should ensure the attraction of the workforce both from their own country and from abroad (Zimenkova et al, 2018; Karácsony et al, 2021). As a specific feature of a megaproject, young specialists may be able to apply for highly qualified positions in the future, sometimes not in the specialty listed in their diploma (Cherednichenko, 2016). The rise in unemployment based on the digitalization of the economy and the introduction of artificial intelligence (Shi, 2019), especially in the context of the pandemic, can also be an impetus for participation in megaprojects.

At the present, under the conditions of the digitalization of the economy and the implementation of artificial intelligence, interest in megaprojects is increasing, however, a unified system for recruiting highly qualified personnel in these projects is yet lacking which causes delays in their completion, the violation of financial discipline, and the reduction or instability of investments. The present article presents an element of the solution to the problem of providing megaprojects with labor resources through attracting the great human potential of megapolis residents.

## **2. Methods**

### **2.1. Design and Hypothesis**

The present study is a continuation of scientific research on the nature of the influence of the digitalization of the economy and the use of artificial intelligence on the social sphere. The scientific and methodological apparatus comprising the purpose, scientific objectives, hypothesis, research approaches and methods in specific combinations, the categorical and conceptual apparatus, as well as the course of the study and its participants were identified in the present work in accordance with this.

The research team is a cross-functional group focusing on achieving the study goal correctly and validly.

**The purpose of the study:** to determine the degree of megapolis residents' readiness to participate in megaprojects under the conditions of the digitalization of the economy and the use of artificial intelligence. **The scientific objectives** set to achieve the study goal include:

1. Determining the nature and the degree of readiness of megapolis residents to take part in megaprojects under the conditions of the digitalization of the economy and the use of artificial intelligence.

2. Identifying the most important factors affecting the attractiveness of a megaproject in the eyes of megapolis residents.

The **hypothesis** put forward in the study is as follows:

**H1.** The degree of megapolis residents' readiness to participate in megaprojects under the conditions of the digitalization of the economy and the use of artificial intelligence is ambiguous and depends on their age, the sphere of activity, and the factors of the attractiveness of a megaproject.

**The factors of the attractiveness** of a megaproject are understood as the most important factors ensuring megapolis residents' positive opinion from the point of possible participation in a megaproject.

The study was organized and conducted in Moscow in the period from January 10, 2020, to June 10, 2021. The study involved 719 residents of the megapolis with a general population of 12,500,000 people. The sampling error was 3.75% with a 95% confidence level. The main quota features in the selection were sex, age, education, and work experience.

Analysis of the data in Table 1 shows that more than twice as many women as men participated in the study.

Table 1 - Socio-demographic characteristics of the respondents (in %)

Characteristics of the respondents		Share of respondents
Sex	male	31%
	female	69%
Age	14 to 18 years old	2%
	19 to 25 years old	65%
	26 to 35 years old	22%
	36 to 55 years old	9%
	56 to 65 years old	1%
	over 65 years old	1%
Education	higher	39%
	incomplete higher	38%

	secondary special	15%
	secondary	7%
	primary	1%
Working experience	1 year	26%
	1-3 years	35%
	4-5 years	18%
	6-10 years	11%
	over 10 years	10%
Nature of work activity	руководитель	13%
	specialist	48%
	government employee	11%
	blue-collar	15%
	self-employed	9%
	unemployed	4%

This aspect is partially explained by the gender ratio in Russia: 46% of men to 54% of women (FSSS, 2021), as well as by the greater activity of women in taking part in sociological research. Considering the age demographics, the study of the readiness for participation in megaprojects is conducted with the participation of young people aged from 19 to 25 (65%) and from 26 to 35 years old (22%) (Table 1).

This approach is explained by the high mobility of these age cohorts, the desire to make a career at the start of the labor path, and, to a certain extent, the desire for freedom and independence, and romance.

From a qualitative point of view, the study participants are mostly in the high-intellectual zone: 39% have higher education and 38% have incomplete higher education. Only 22% have specialized secondary education (15%) and secondary education (7%). Undoubtedly, there is a high need for highly qualified personnel in megaprojects but there are also quite a lot of positions requiring secondary special education. The respondents' work experience is predominantly 1-3 years which points to them being at the beginning of their career path. This factor can work in favor of a megaproject if the personnel management system provides them with supervision by experienced workers and managers and uses modern technologies such as coaching, mentoring, shadowing, buddying, etc. The distribution according to the nature of labor activity is in favor of specialists which is most valuable for filling basic positions in almost all megaprojects. Managers (13%) and blue-collar professionals (15%) are represented almost equally which also corresponds to the percentage ratio in several high-tech megaprojects that have some demand for managers and laborers.

## 2.2. Data Collection and Sample

The main methods and approaches used in the study are the general scientific and specialized methods including such empirical methods as a sociological survey (a questionnaire with a 5-point Likert scale), in-depth interviews, and a focus group. Due to the restrictions associated with the COVID-19 pandemic, the entire study was conducted in a distance format using Google Forms, Skype VoIP service, and the cloud conference platform Zoom.

In this study, a megaproject is understood as a variety of projects interconnected in terms of tasks, place, and time and fully supplied with necessary resources within the framework of achieving a common goal (Zorban, 2019, Trotsky, 2011). Artificial intelligence (AI) refers to intelligent computer programs, systems aimed at creating intelligent reasoning and action. AI can also be robots in an anthropomorphic form. Digitalization is the process of introducing digital information and communication technologies into all spheres of social life (Vinichenko et al., 2021).

The day before the sociological survey, the respondents were explained the main concepts used in the study. A pilot study was conducted before the main survey – the questionnaire was tested on a sample of the residents of the Ostankinskiy District of the North-Eastern Administrative District of Moscow. To determine the **factors of attractiveness**, experts ranked the factors using pairwise comparison matrices. As a result, ten main factors having a significant influence on megapolis residents' readiness to partake in megaprojects are identified. They include the opportunities to gain work experience in a large project, to receive a good salary, to make a career, and to become a pioneer in a big business, as well as interest in communication with different people. The respondents were recruited for the sociological survey through the “snowball” method.

The in-depth interviews were conducted to reveal the Muscovites' opinions on the attractiveness of megaprojects and clarify the nature of the fears of respondents who expressed partial readiness to participate in megaprojects. Respondents for in-depth interviews were recruited by random selection. 18 respondents participated in an in-depth interview. The procedure of in-depth interviews, their structure, and questions are developed based on the results of the sociological survey.

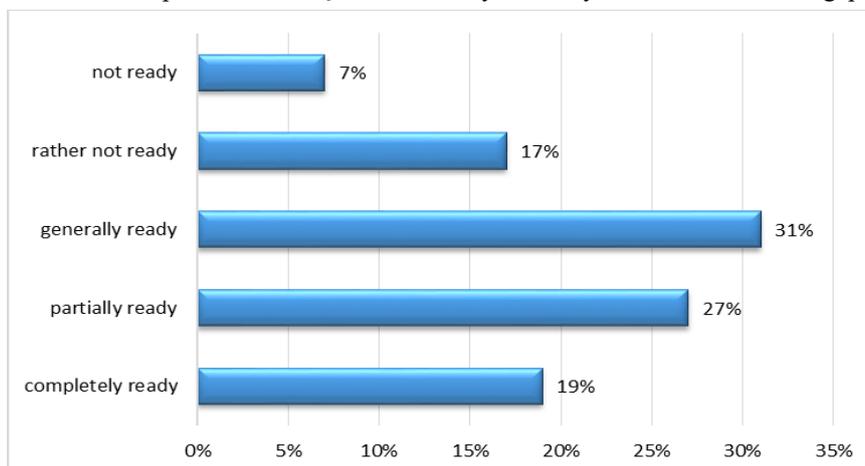
For a systemic discussion of the problematic issues, a focus group was formed. It included both Russian and foreign experts who were specialists in the field. In total, the focus group included 8 experts.

The results of empirical research form the basis for statistical data processing, analysis, and discussion of the problem.

### 3. Results

In the course of the study, it was established that the majority of the respondents are ready to participate in megaprojects under the conditions of the digitalization of the economy and the use of artificial intelligence (Figure 1).

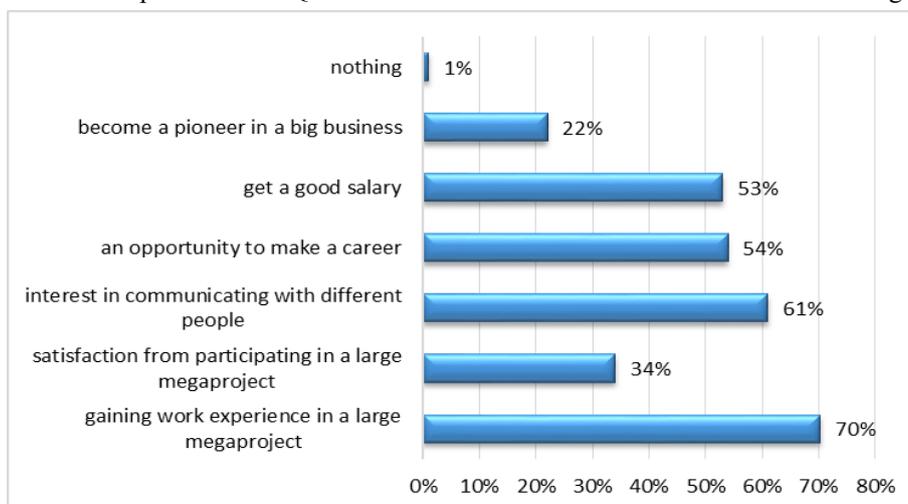
Figure 1 - Answer Options for the Question: “Are you Ready to Take Part in a Megaproject?”



Meanwhile, only 19% of the respondents show complete readiness to enter a team of a future (or an existing) megaproject and as little as 7% of the respondents are completely not ready to do so. The rest of the sociological survey participants express some doubts about the possibility of their participation in megaprojects. In general, about a third of the megapolis residents are ready to participate in a megaproject (31%).

The identification of the factors of the attractiveness of megaprojects under the conditions of the digitalization of the economy and the use of artificial intelligence reveals priority zones for the sake of which megapolis residents are ready to participate in a megaproject (Figure 2).

Figure 2 - Answer Options for the Question: “What is the Most Attractive for You in a Megaproject?”



Over 50% of the respondents' votes are distributed across only four factors. At the first place is the opportunity to obtain the experience of working in a large project (70% of the respondents), at the second place is interest in communicating with different people (61%), the third place is occupied by the opportunity to make a career (54%), and the fourth place is taken by the opportunity to get a good salary (53%). Significantly lower are the ambitions of gaining satisfaction from participation in a grandiose megaproject (34%) and becoming a pioneer in a big business (22%). A significant difference from the other factors is observed for the lack of attractiveness of megaprojects – only 1% of respondents.

The least attractive factors with less than 1% of votes are the striving to implement one's professional skills (0.1%), the opportunity to communicate in a foreign language in a foreign company (0.1%), access to information (0.1%), and avoiding deployment in the army (0.1%) (Table 2).

Table 2 - The Least Attractive Factors of Participating in Megaprojects (in %)

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

Overall, the results of the sociological survey reveal the degree of readiness and the ratio of factors of the attractiveness of participation in megaprojects for the residents of the Moscow metropolitan area under the conditions of the digitalization of the economy and the use of artificial intelligence.

#### 4. Discussion

The conducted sociological survey demonstrates that the opinion of the megapolis residents on the examined issue is overall evenly distributed, with a slight preponderance of the general willingness to participate. The study shows that only a small portion of the metropolis residents are categorically against participation in megaprojects. Such statements most often demonstrate a generally positive attitude toward this sort of project. At the same time, it is necessary to create favorable conditions that would serve as the critical point allowing to convince a person to make the specific decision to participate in a megaproject. This finding is to a certain extent consistent with several studies (Britto et al, 2020; Vinichenko, et al, 2019).

In the focus group, the experts argued that the majority of megapolis residents are only hypothetically ready to participate in megaprojects due to the fact that relatively high salaries and the opportunity for career advancement are already provided in the megapolis itself. Therefore, there is no need to move outside of it. At the same time, there arises the opportunity to participate in a megaproject in the distance format for IT specialists and fragmentally for specialists in logistics, marketing, HR, management, and several other positions. The specialists who are completely ready for significant changes in terms of the place and time of work are more often those who were unable to realize themselves in the megapolis' labor market to the full extent of their ambitions. In addition, there is also the option of getting a higher position at a startup in a megaproject to then return to the higher level of the megapolis labor market 1-2 years later. This shows the **trend** of fragmentary and temporary readiness of megapolis residents to participate in megaprojects.

The in-depth interviews were conducted to reveal the main reasons for the identification of the leading attractiveness factors. This portion of the study confirmed that the most important factor is the opportunity to obtain the experience of working on a big project. In the conversations, the respondents clarify that participation in a megaproject is a sort of generalized factor for them. It has to become a springboard for their future professional activity that would increase their social status, provide the opportunity to develop their creative potential, and allow joining an effective and promising team. This approach is somewhat consistent with the arguments of several researchers (Lee et al, 2020; Matraeva et al, 2020; Hogan, 2020) considering this path to be promising.

The second most important factor, interest in communicating with different people, stems from the first one and some in-depth interview participants consider them equal. This factor implies established communication leading to satisfaction from the favorable socio-psychological climate and the management style of the manager, as well as the acquisition of new friends, and increasing loyalty in the course of the adaptation in the new team (Chulanova et al, 2018). A separate issue is harmonious communication with the representatives of different socio-ethnic and religious groups under the conditions of the digitalization of the economy and the use of artificial intelligence which coincides with several studies (Nikiporets-Takigawa, 2018; Oseev et al, 2018). On the one hand, this issue somewhat concerns the respondents, on the other, they are open to equal, non-discriminatory relationships. Logically tied to the aforementioned is the factor of the opportunity to make a career. Indeed, megaprojects involve the mass participation of workers of different specialties and levels of training with quite deep management structures. This raises hopes for career growth both in the older and younger generations. Studies show a certain need for career growth in talented young professionals, especially at the initial stage of employment (Kirillov et al, 2017).

The desire to get a good salary is also among the priorities, although only in fourth place. In in-depth interviews, the respondents explain this with the fact that megaprojects, in their opinion, are provided with good financing and imply high wages or the possibility to get it as soon as possible with active and effective work. This was especially evident in the judgments of young people between the ages of 19 and 25. This finding is to some extent consistent with the research of some scientists (Chulanova et al, 2018).

The satisfaction of ambition was also noted to a greater extent among young people between the ages of 19 and 25. They want to be proud of their participation in a grandiose megaproject, first of all, in front of their peers and to become a pioneer in a big business. For the sake of this, they are willing to endure the inconveniences of everyday life and physical and moral overload. At a young age, people are ready for long-distance moves and enthusiastic about big and great things and want to take part in them. At the same time, they strive to lay the foundation for a future career and return to their metropolis as a mature leader or specialist.

In the focus group, the experts concluded that the identified group of major factors of attractiveness is mostly characteristic of young people at the age of 19 to 35 years old which is partially supported by the in-depth interview on the issue of salary. This potential of young people was often used by state structures during the implementation of megaprojects, for example, during the construction of the Baikal-Amur Mainline (BAM) in the Soviet Union. This demonstrates a certain **dependence** of megapolis residents' labor activity in megaprojects on age: the younger the age, the higher the communicability and labor activity and readiness to move and change the place and conditions of work.

The considerably low results of the sociological survey obtained for the factor of the opportunity to implement one's professional skills and abilities in a megaproject under the conditions of the digitalization of the economy and the use of artificial intelligence did not appear quite logical. In the in-depth interviews, the respondents clarify that most of them do not yet possess sufficient knowledge and experience in the introduction of digital technologies and the use of artificial intelligence. Their work experience primarily lies in the service sector – trade and the public sector as workers and less often as managers. Participation in a megaproject is associated by the respondents with the opportunity to prove themselves in some new areas. At the same time, the respondents do not express the desire to improve their digital competencies or the skills of working with artificial intelligence, although they are aware of the relevance of this problem. This finding somewhat correlates with the research of other scientists (Demchenko et al, 2017).

The opportunities to communicate in a foreign language and have access to megaproject information as attractiveness factors are characteristic of mature, established people actively developing their soft and hard skills in all areas of labor activity who mainly focus on multifaceted career development simultaneously as a specialist and a manager. Such people are always in short supply in all projects and finding them is a huge success for megaproject managers. Avoiding deployment in the army is also not too popular even among young people which generally corresponds to the increased social status of service in the army.

During the focus group, the experts argued that the low level of the factor of the opportunity to implement one's professional skills and abilities in a megaproject is generally logical. Quite a large number of university graduates engage in part-time work in low-skilled positions during their studies and after graduation. Megapolises always have a high demand for such workers in the public sector, trade, service sector, and especially in carriers in pandemic conditions. As a result, several university graduates have certain insecurity and fear in taking a position in serious companies in the absence of deep knowledge and proper experience in the profession. This shapes the **trend** of the striving of young megapolis residents to obtain new professional knowledge and skills in megaprojects.

## 5. Conclusion

The study shows that megapolis residents' readiness to take part in megaprojects under the conditions of the digitalization of the economy and the use of artificial intelligence is ambiguous. For the organizers of megaprojects, obtaining one of the main resources for achieving the objectives of the megaproject – human resources – is often critical. This is especially true for innovative projects aimed at increasing the digitalization of the economy and the use of artificial intelligence.

The study reveals that the factors of the attractiveness of participating in megaprojects for megapolis residents are the opportunity to gain experience of working in a large-scale project, interest in communicating with different people, and the opportunities to make a career and get a good salary. Also noteworthy among the important factors is satisfaction from participation in a grandiose megaproject and becoming a pioneer in a big business.

The factors of negligible importance are the opportunity to implement one's professional skills, to communicate in a foreign language in a foreign company, getting access to information, and avoiding deployment in the army.

The study identifies the **trends** of the fragmentary and temporary willingness of megapolis residents to take part in megaprojects and the striving of young citizens to obtain new professional

skills and abilities in megaprojects. It is established that the labor activity of megapolis residents in megaprojects is contingent on their age: the younger they are, the higher their communicativeness and industriousness and readiness for moving, changing the place and conditions of work.

Overall, the hypothesis is confirmed – the degree of megapolis residents' readiness to participate in megaprojects under the conditions of the digitalization of the economy and the use of artificial intelligence is ambiguous and depends on age, the sphere of activity, and the factors of the megaproject's attractiveness.

The obtained results can be used to improve the state personnel policy and the system for the formation of personnel potential in a megaproject.

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