Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Virtual labor market during the COVID-19 pandemic and their impact on transport industry

Tatyana Rusakova*, Olga Saychenko*

*State Marine Technical University (SMTU), 190121, Lotsmanskaya Ulitsa, 3, St. Petersburg, Russia

Abstract

The shocks of the pandemic and the economic downturn became factors that challenged, first of all, new market structures in the national economy, the formation of which was associated with the development of information and communication technologies and the globalization of the information space. It was they who had to offer new ways to adapt to stress factors and find new areas for development. One of such structures in the Russian Federation is the virtual labor market. The lack of publications on the mechanism of its functioning in a pandemic made the research topic proposed by the authors relevant and innovative. The article proposes criteria for adapting the virtual labor market in a pandemic, on their basis, non-price tools for its adaptation are identified, and the prospects for cooperation between transport enterprises and the virtual labor market. The identified trends can be assessed as an innovative adaptation to the conditions of uncertainty associated with the active restructuring of virtual interaction channels. Of particular importance is the growth in intensity and expansion of communication channels for transport enterprises, since the solution of their systemic problems is possible only through the use of a wide range of intellectual and information products and services. The materials can be of practical importance for the creation of the main institutions of the virtual labor market and the development of strategic decisions for transport enterprises.

1. Introduction

With the growing volatility and uncertainty of the external environment, its constant initiation of new challenges, the high speed of digital transformation and systemic socio-economic consequences, the old ways of coordinating relations based on a rigid vertical hierarchy and a well-ordered rigid model of traditional markets begin to demonstrate the weakness of their adaptation mechanisms. Therefore, even today in the economic system, it is
possible to see the formation of new market structures and new ways of coordinating relations in intrasystem interactions, as a result of which traditional market structures are either replaced or supplemented by new ones, or acquire new properties and development trajectories (Schislyaeva et al., 2020). A good example is the national labor market, which, being an open system, has always remained susceptible to changes in the external environment.

In the context of the digitalization of the economy, confirmation of this ability of the labor market to generate innovations in intrasystem interactions in response to the challenges of the external environment, in our opinion, was the emergence of its new subsystem – the virtual labor market. The analysis of the adaptation possibilities of the virtual labor market has become especially relevant in the context of the COVID-19 pandemic. If the traditional labor market in such a short time is able to use only modifications of already existing adaptation mechanisms, then the virtual market could offer new adaptation mechanisms based on innovation. Nowadays, the scientific community has had the opportunity to study the response of the virtual market to the first serious challenge from the external environment. Based on the foregoing, the purpose of this paper is to analyze the main trends in the development of the virtual labor market in the Russian Federation (RF) in a pandemic. The following research issues have become relevant for the authors:

- disclosure of the features of social and labor relations in the virtual labor market;
- selection of criteria for adapting the virtual labor market to the conditions of a pandemic;
- study of quantitative and qualitative changes in the development of the virtual labor market, taking into account the selected criteria, determination of the main adaptation tools;
- determination of the potential for the use of tools to adapt the virtual labor market to the challenges of the external environment in the market of transport and logistics services;
- identifying the strengths and weaknesses of the Russian virtual labor market, as well as identifying external opportunities and threats to its functioning in the long term.

The hypothesis of this research is that in the context of a pandemic, the Russian virtual labor market quite successfully used new for the national labor market tools for adapting to the challenges of the external environment in a short time and demonstrated promising development trends, but was unable to realize its advantages in a number of sectors of the economy, for example, in transport.

The topic proposed by the authors is notable for its relative scientific novelty and poor development. But judging by both foreign (Aneesh, 2008; Dube et al., 2020; Horton et al., 2018) and domestic Russian literature (Lapidus and Polyakova, 2018; Sadovaya, 2018), interest in this issue begins to grow. Nevertheless, it seems to us that publications are still not enough to create a holistic concept of the virtual labor market. In particular, until now, the literature uses a different terminological apparatus, the main attention is paid to the analysis of the advantages and disadvantages of virtual employment and its comparative analysis with traditional forms of social and labor relations. There are almost no publications that would reveal in detail the system-wide properties of the virtual labor market, internal and external factors in the evolution of its structure. The question whether the virtual labor market, being at the stage of formation, has certain opportunities for self-organization remains open. Moreover, in our opinion, the understanding of the logic of the development of the virtual labor market as a complex open system that has certain tools for adapting to dynamically changing external factors in a pandemic is becoming more relevant. However, most publications are devoted to analyzing the impact of the pandemic on either platform work or the practice of remote work (both concepts are broader than virtual work) (Banik and Padalkar, 2021; Chandler, 2020; Loktyukhina and Chernykh, 2020). Unfortunately, we are forced to state the lack of scientific papers devoted to the impact of the pandemic on the virtual labor market in the Russian Federation (Sautkina, 2020). Moreover, there are no articles that reveal the features and problems of its functioning in certain sectors of the economy, for example, in transport. At the moment, transport companies show little interest in even a more well-known form of interaction, outsourcing (Nikishov, 2021; Sanchis-Pedregosa et al., 2018).

2. Materials and methods

As a theoretical basis for the study, the authors chose publications of scientific literature within the framework of the problem under consideration, operational sources of information in professional media, as well as previous studies of the authors. The specificity of the information base of the study was caused by the lack of statistical observations of the functioning of the virtual labor market in the Russian Federation during the pandemic. In this
regard, the authors independently analyzed the results of studies of the Russian freelancing market carried out by the TalentTech IT holding together with the National Research University Higher School of Economics and the largest Russian freelance marketplace for finding remote work FL.ru, the Kwork freelance services marketplace, PwC in Russia, QIWl company and Freelance.ru freelance marketplace. Data from the Federal State Statistics Service of the Russian Federation and the Ministry of Transport of the Russian Federation were also involved.

3. Results

One of the innovations that opened up the possibility of alternative options for the transition to a new qualitative state of the national labor market and created its new integrative properties as a system is the emergence of the virtual labor market. Given the multifaceted nature of this concept, the controversial nature of its interpretation, and the lack of practical research, it seems appropriate to us, within the framework of this paper, to dwell only on its essential characteristics.

First, the mechanism for the functioning of the virtual labor market is based on economic relations that are built between the entities offering and buying labor information services and contacting through digital platforms in the global information space. Therefore, we do not refer a remote taxi dispatch service (Yandex Taxi, Uber, Gett) or an actively functioning online shopping to a virtual market. Secondly, due to the lack of institutionalization of the virtual labor market at this stage of development, we propose to outline its boundaries with only two categories of workers:

- freelancers - independent workers who conclude a civil contract or a fixed-term employment contract with one or more employers at the same time to complete a specific task on time through online platforms for freelancers;
- virtual employees - full-time employees who conclude an open-ended or fixed-term employment contract with one employer for permanent or part-time employment and contact the company's management through the use of information and communication technologies.

The COVID-19 pandemic has become a serious test for the country's economic system, one of the new structural elements of which is already a virtual labor market. Measures related to its restrictions, first of all, lockdowns introduced in all regions of the country, the use of remote forms of work in many industries, when not all employers and workers were technologically and morally ready for this, led to a large-scale economic recession. Russian Federal State Statistics Service data showed that the country's GDP in 2020 decreased by 3.1% in annual terms (According to “The fall of the Russian economy was the maximum in 11 years, 2021”, https://www.rbc.ru/economics/01/02/2021/6017e181a7947c99f23f95). This was partly due to a decrease in the entrepreneurial and investment activity of businesses, and even the termination of the business itself. So, in the context of a pandemic and economic shocks, 1.54 million legal entities, individual entrepreneurs, and farms were forced to close their businesses, which amounted to about a fifth of operating businesses in the Russian Federation. Unfortunately, today there is still high uncertainty about the timing of the continuation of the pandemic itself, and, consequently, the prospects for overcoming the economic downturn. In this regard, the time lag for the recovery of activity to the pre-crisis level is likely to grow. About 15% of the companies that took part in the research of the Center for Macroeconomic Analysis and Short-Term Forecasting suggested that their business would inevitably shrink, 44% of the companies noted that it would take more than a year to recover. In the summer of 2020, companies were more optimistic (Shokhina, 2021).

One of the most serious consequences of the pandemic for society and the economy was the situation on the labor market. First, if in March 2020 the registered unemployment rate was 1%, then by September it rose to 4.9%, and in December it slightly decreased to 3.7% (According to “Employment and unemployment in the Russian Federation in December 2020 according to operational statistics, 2021”, https://rosstat.gov.ru/storage/mediabank/BCqK9Q8M/zanyatost.pdf). Thus, for the first time in the history of Russian cyclical crises, the labor market reacted to the recession not only with a reduction in wages, a decrease in labor intensity and a reduction in the average number of hours worked, but also with an increase in unemployment. Secondly, already at the end of March 2020, the need to comply with the isolation and social distance regime forced employers to urgently transfer employees, in whole or in part, to remote work in almost all industries and organizations where the prerequisites were previously created for this.
Summarizing the above, it can be assumed that it is the interweaving of exogenous non-economic shock (Covid-19 pandemic) and endogenous shock (economic recession) that became the main factors of the external environment for the virtual labor market in 2020. They evoked its reaction to the challenge presented and allowed, through appropriate changes, demonstrating its adaptive capabilities. It was the directions of these changes that determined the main trends in the development of the virtual labor market. As part of our analysis, we propose to assess its ability to adapt according to such criteria as
- the speed of market recovery and the level of its stress resistance;
- change in the intellectual component of labor;
- the degree of participation in the processes of reallocation of labor resources.

Starting the analysis, we were forced to limit it to only a segment of the freelance market due to the lack of information on virtual employment in the official labor market statistics. Nevertheless, we believe that the available database on freelance employment in a pandemic provides a basis for identifying the main trends in the development of the virtual labor market.

One of the most notable trends has been the high level of stress tolerance demonstrated by the freelance market during the pandemic. The main technological factor that has ensured an increase in the level of stress resistance of the virtual labor market is the rapid growth of digital platforms. In the first year of the pandemic alone, the number of online web platforms in the world has tripled (According to https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-moscow/documents/publication/wcms_773235.pdf. “Worldwide employment and social protection prospects. The role of digital labor platforms in transforming the world of work: ILO flagship report, 2021”).

One of the key indicators of stress resistance, in our opinion, can be considered the dynamics of changes in registered freelancers and customers. All these indicators in 2020 showed an upward trend on the main freelance marketplaces in the Russian Federation. Thus, on Freelancehunt, the number of registered freelancers increased by 48.7%, and the number of customers of freelance services - by 32.9% (According to Results of 2020: which specialists have grown in demand and how much money was spent on freelancers, https://freelancehunt.com/blog/itoghi-ghoda-2020-na-kakikh-spietsialistov-vyros-spros-i-skolko-dienieh-potrachieno-na-frilansierov/). On the largest freelance marketplace FL.ru, these figures were 76% and 38%, respectively (According to Freelance Customer Survey 2020, https://talenttech.ru/research/nazvanie-issledovaniya-1-dubliat-3/). The growth of freelancers on Kwork was 123%, and the growth of customers - 93% (According to Annual research by Kwork, 2021, https://blog.kwork.ru/rynok-frilansa/rynok-frilansa-cifry-dengi-vliyanie-pandemii-i-trendy-2021). However, our hypothesis that the freelancing market has acquired a new quality after recovery is more confirmed by the data on the growth of budgets and turnover. For example, in 2020 on Freelancehunt, the level of budgets increased by 19.2%, and the number of projects by 14.9%. According to PwC forecasts, the volume of the freelance market in the Russian Federation, calculated by the volume of revenue, will amount to $ 48 billion in 2020 and will demonstrate an 11% increase compared to 2018 (According to Gig Economy, February 2021, https://www.pwc.ru/ru/publications/issledovaniiya-rynka-freelance-uslug.html).

We believe that another argument confirming the high level of stress resistance of the virtual labor market is the trend towards partial replacement of office work with remote work. This process was significantly influenced by the growth factors in the demand for freelance services in the context of the pandemic. First, the pandemic initially forced companies to move from office work to remote work. As a result, the prerequisites were created for the wider involvement of freelancers in project work for a certain period. Secondly, in order to save costs, the business revised its supply chains and relations with intermediaries. In a pandemic, it became profitable to contact specialists offering high-quality and scarce competencies directly through digital platforms, refusing to work with intermediary structures. Thirdly, it was freelancers who were better prepared than office workers to work in the face of uncertainty. Due to the specifics of their activities, even before the start of the pandemic, they were accustomed to taking a responsible attitude to the constant growth of competencies, individualizing their careers, not reducing it to working for one customer, taking care of their reputation, evaluating the future variably, without fear of change. In times of crisis, these qualities of freelancers have helped businesses, both small, medium, and large ones, to significantly accelerate the solution of tactical tasks, improve the quality of work performed, provide access to wide expertise, quickly rebuild the current process model, achieve significant cost savings, and implement elements project approach to the management system.
Freelance market research has shown that during the pandemic, more than a third of customers bought freelance services every month, 10% - almost every day. More than half of the companies ordered freelancing services exclusively for work on individual projects, slightly less than half - both for work on individual projects and for operational activities. Thus, it can be assumed that it was profitable for the business to redistribute more and more permanent jobs from regular employees to freelancers. On the other hand, this data also speaks of an increase in business confidence in freelancers. In our opinion, the experience gained in working with freelancers will probably only increase the demand for freelance services in the future. Thus, 40% of global companies have already announced that they are interested in further growth in the number of freelancers, and 25% of companies intend to replace up to 30% of full-time employees with freelancers.

Nowadays, it is obvious that the virtual labor market (judging by the freelance market), having demonstrated a high level of stress resistance during the pandemic, is able to go beyond its traditionally complementary role in the system of the national labor market.

Another trend that, in our opinion, is worth paying attention to is the increasing intellectualization of the work of virtual workers. The trend has several forms of manifestation. One of them is the ongoing process of forming a new type of workers with creative abilities in processing information and creating an intellectual product. So, according to experts, the professional structure of the virtual market during the pandemic almost did not change, despite the economic downturn and restrictive measures. Programming, design and marketing have retained the leading positions in it. The development of mobile applications, industrial design, presentations and info-graphies, SEO promotion, servers and hosting, etc. had a significant turnover in 2020. Further changes in the professional structure will be associated with the activities of those creative workers who can offer scarce competencies in the areas of web development, mobile offerings, information security, brand management, UX design, etc. It is these professions that are already distinguished by the growth in demand for them, and the growth of registered profiles.

Another form of manifestation of the intellectualization of labor in the virtual market in a pandemic was the active educational motivation of freelancers. Despite the high assessment of their competencies and soft skills, the majority of freelancers improved their professional skills in 2020. Among them were both experienced highly professional freelancers raising their qualifications in order to acquire scarce competencies and soft skills, and intermediate freelancers or “beginners” interested either in changing their profession or in improving the qualifications necessary for the implementation of future projects. Thus, the intellectual capital of workers operating in the virtual information space is increasingly acquiring new innovative properties. Gradually, it turns into one of the main factors in the formation of the country's innovative capital. This is extremely important today, when almost all economic processes have slowed down for several months, and most importantly, there are risks of deterioration in the quality of the country's intellectual capital.

Finally, another trend was the active participation of the virtual market in creating prerequisites for the growth of territorial mobility of labor resources in the context of a pandemic. In our opinion, the pandemic, having given impetus to the transfer of many types of work activities from offices to the global network, has laid the foundation for virtual labor migration. The virtual recruitment of employees from other regions became possible also due to the fact that in the year of the pandemic in the Russian Federation, the use of electronic work books was allowed and a digital signature was recognized. In addition, the attraction of freelancers from other regions was beneficial for the business as well. It got the opportunity to save money on the wages fund and social benefits due to the existing regional difference in wages, structure and cost of social packages. Thus, the COVID-19 pandemic has accelerated the virtualization of the territorial distribution of the workforce. Online platforms for job search and jobseekers have helped with the need for scalability and digitalization of business, difficulties in finding a job and maintaining a decent level of material well-being in the face of economic downturn and constraints.

Concluding the consideration of new trends in the development of the virtual labor market, it seemed interesting to us to look at the sectoral structure of customers for freelancing services in a pandemic. Trade and industrial enterprises actively used the services of freelancing. Of the surveyed customers, each group was 10-11%. Freelance services were much less in demand by transport companies. They accounted for only 3% of the surveyed customers. It would be a huge oversimplification to see this as some kind of dependency. But to ignore the low demand for freelance services from transport companies, in our opinion, can be a strategic mistake for several reasons. First, the transport industry is recognized today by many experts and the government of the Russian Federation as one of the most affected by the pandemic. The freight turnover of transport in Russia in 2020, according to, decreased
compared to the indicator for 2019 by 4.9% of the Ministry of Transport of the Russian Federation (According to Transport of Russia. Information and statistical bulletin January-December 2020). At the same time, the multiplier effect of a reduction in GDP was noted in terms of its impact on the deterioration of transport performance. Secondly, as global trends show, new business models based on digital technologies should become a driver for transport enterprises to overcome the crisis. Their implementation is able to provide transport enterprises with cost optimization when moving material flows and goods to the consumer, expanding the provision of services with high added value, a high probability of predictability of trends based on virtualization of permissible combinations of transport and logistics resources, transparency of supply chain movements, the ability to manage logistics processes in the mode real time, reorganization of companies into multimodal, etc.

According to the forecast of the Institute for Statistical Research and Economics of Knowledge of the Higher School of Economics, the demand of the transport and logistics industry for advanced digital technologies by 2030 may grow to 626.6 billion rubles (Gokhberg, et al., 2021). This should provide an average annual growth rate of the transport industry at the level of 20.4% (Gokhberg, et al., 2021). However, it is the “digital readiness” of the transport industry that can stall the use of digital technologies such as paperless document management, automation and robotization, blockchain, the "physical" Internet, etc. For example, in a PwC study on the Industry 4.0 concept, the share of transport and logistics companies assessing their current level of digitalization as “advanced” was only 28% (According to Shifting patterns: The future of the logistics industry, PwC’s future in sight series, 2017. https://www.pwc.ru/ru/assets/pwc-logistics-transformation-rus.pdf). Consequently, with an optimistic development of events, transport companies will soon need new intelligent and informational products and services. For their independent development, most small and medium-sized companies do not have the necessary competencies of their own personnel, the necessary infrastructure, as well as financial resources. In view of the above, the freelance market offering off-the-shelf information products and services may be of interest to transport companies. However, as we noted earlier, the majority of transport companies feel distrustful of the services offered to freelancers. And this is a new challenge for the virtual labor market, the answer to which can be the segmentation of the virtual labor market according to the industry principle and the offer of system services, prepared taking into account the peculiarities of the transport industry for a specific client. For example, we can talk about a set of intellectual and information services, including the reorganization of business models for the provision of transport and logistics services based on the use of breakthrough technologies, project management based on visualization and virtualization of transport and logistics functions, inventory management, monitoring of order fulfillment in supply chains, consulting, marketing, etc. Unfortunately, today freelancers offer transport companies products in the field of advertising, creating their own website or database, developing a map or scheme of transport routes and location of points. Much less common, for example, are proposals for collecting, processing and visualizing data in Power BI and other IT services. Thus, the potential for interaction between transport companies and freelancers is significant, but its implementation depends on the desires and competencies of both parties.

New trends in the development of the virtual labor market in the context of the COVID-19 pandemic are already a fait accompli. Today, the question of how sustainable they will be is of great importance. To answer it, the authors carried out a SWOT analysis of the virtual labor market, the results of which are presented in Table 1.

| Table 1. SWOT- analysis of the virtual labor market (Source. Compiled by the authors). |
| --- | --- | --- |
| **Strengths** | **Weaknesses** |
| optimization and scalability of business processes through flexible recruitment of high-level professionals regardless of their place of residence and the state of regional labor markets; accelerating and ensuring high quality solutions to the client's problems thanks to the expertise and specialization of flexible resources; high growth rates of the freelance market before the pandemic and its rapid recovery during the pandemic; low entry threshold, maximum variety of orders, moderate commission as tools for adapting universal Russian freelance marketplaces to economic downturns; freedom of choice for the virtual workers of the customer or organization; | lack of competencies among business leaders, HR specialists and managers in the field of project activities and work with flexible staff; social insecurity of virtual workers, including freelancers, (conclusion of civil contracts or fixed-term employment contracts, weakening of labor protection, lack of corporate training or retraining programs, lack of a social and pension insurance mechanism, automatic protection of savings from each payment transaction addressed to a freelancer); volatility of size and irregularity of income generation; lack of trade unions and other forms of collective organization of virtual workers; lack of educational programs for retraining personnel in professions in demand in the virtual labor market, including the freelance market; lack of a clear legal framework governing the status of a virtual worker; lack of a system of continuing professional education in the virtual worker - platform - employer triad, taxation mechanisms and transaction security. |
project, as well as flexible working hours and the ability to manage their career; increased professionalism of freelancers, high mobility and motivation for self-education.

| Opportunities                                                                 | Threats                                                                 |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------|
| the growth of online business (especially during the crisis associated with the pandemic); a decrease in the share of the working-age population in Russia and a growing shortage of personnel; expanding the scope of distance employment during the pandemic and business plans for the use of mixed forms of employment after its end; increased awareness of the population about the mechanisms of organizing remote work, its legal status, risks and benefits; globalization of the information space, including through the development of B2B Human Cloud; accelerating the transition of companies to network structures with a predominance of horizontal links. | lack of social dialogue between digital labor platforms, virtual workers, business and government; lack of a system of continuing professional education in the country; lack of conceptual development of the virtual labor market, which hinders institutional transformations, the development of legislative acts and programs of its state regulation; lack of protection of personal and labor data of employees, as well as data related to enterprises and their activities on platforms; lack of systematic statistical analysis of the virtual labor market at the state level, which makes it difficult to assess its potential; unpredictable duration of the COVID-19 pandemic. |

The SWOT analysis showed that, on the one hand, the development of the virtual labor market (including the freelance market) is likely to be carried out along an ascending trajectory, since, firstly, the market has properties that are especially important during periods of uncertainty and volatility of the economic development: flexibility, dynamism, the ability to self-organize. Secondly, the processes of globalization, networked forms of business and informatization of the economy can remove many restrictions on the growth of the capacity of the virtual market, which are inherent in the traditional labor market. On the other hand, the SWOT analysis gave reason to believe that today the growth rate of the virtual market is hampered by the lack of institutions and tools necessary for its development, which entails not only social insecurity of the interaction participants, but also retains a significant shadow potential of virtual employment. In the case of an optimistic scenario, the virtual labor market will be able, according to the authors, to make a significant contribution not only to ensuring the stress resistance of the national labor market, but also to the innovative development of the Russian economy.

4. Discussion

From the authors’ point of view, elements of scientific novelty are present in the theoretical, logical and statistical substantiation of the adaptation trends in the development of the virtual labor market in the Russian Federation in the context of the COVID-19 pandemic.

The most significant results of the study, confirming the hypothesis put forward by the authors that, in the context of a pandemic, the Russian virtual labor market quite successfully used new for the national labor market tools for adapting to the challenges of the external environment in a short time and demonstrated promising development trends, are as follows:

- firstly, the objective mechanism of the emergence of a special, virtual subsystem within the framework of the national labor market is revealed. The formation and development of the virtual labor market is carried out in parallel with the development of information and communication technologies and digital platforms, reducing the cost of their use, increasing their accessibility, as well as the growing diversity of the global information space. It is distinguished from the traditional subsystem of the labor market by the emergence of an informational subject of the market, namely, digital platforms, the transfer of the interaction of all interested parties to the global network, a high degree of flexibilization in social and labor relations, the informational and intellectual nature of labor services. The authors believe that the opposition of the two systems will complicate the formation of an innovative labor market in the Russian Federation and will only reduce its adaptive potential. Based on this, the study emphasizes that their interaction should be based on the principles of convergence;

- secondly, the main challenges (stresses) to the national labor market from the external environment have been identified, and the response of the virtual labor market has been analyzed. The main stress factors formed as a result of the intertwining of the Covid-19 pandemic and the economic downturn are recognized in the work as a decrease in investment and entrepreneurial activity of business, an increase in unemployment, the need to master the remote employment format in a short time, uncertainty in the pace and scale of the pandemic, etc.;
thirdly, the main trends in the development of the virtual labor market in the Russian Federation, resulting from the use of their own tools of the adaptation mechanism, have been identified. To identify them, the authors used such adaptation criteria as the speed of market recovery and the level of its stress resistance, changes in the intellectual component of labor, the degree of participation in the processes of territorial distribution of labor resources.

Note that in the study, the authors had to rely only on the analysis of one segment of the virtual labor market due to the lack of other statistical information, namely, the freelance market in the Russian Federation.

As shown by the analysis of statistical data, the initial reaction of the virtual labor market coincided with the reaction of the traditional market (reduced orders, reduced user activity and falling wages). Nevertheless, after the summer of 2020, the virtual labor market was able to stop the negative development. It demonstrated not only quantitative (growth in turnover, simultaneous growth in the number of registered customers and performers), but also qualitative growth, gradually replacing office employment with virtual one. All this testified to its ability to mobilize the resources of flexibility and dynamism in a short time, and thus provide a sufficiently high level of stress resistance.

The ability of the virtual labor market to adapt to stress factors in a situation of constraints and uncertainty has been confirmed by two other trends in its development. Firstly, during this period, there was an increase in the intellectualization of the work of virtual workers, which manifested itself in the active motivation of freelancers to self-development and change of professions, expanding the range of offers and orders in the field of information technology and project activities. Secondly, the virtual market took an active part in the effective reallocation of labor resources in a pandemic by expanding the geography of recruitment and employment;

fourthly, the main tools for adapting the virtual labor market have been identified. If the traditional labor market system in crisis situations first of all reacted by reducing wages and expanding part-time or non-traditional employment, then the virtual market during the pandemic used innovative tools to neutralize external threats. As such tools, the study included virtual employment, virtual migration, recruitment flexibility, quality and speed of order fulfillment, advanced training and retraining, as well as the development of soft skills, etc.;

fifthly, the sectoral boundaries of the use of innovative forms of adaptation of the virtual labor market were established. Thus, for example, they have been poorly utilized by transport enterprises. However, developing information management technologies and new methods of intelligent organization of transport-forwarding activity actualize the problems of finding solutions in the field of optimization of management techniques and organization of transport and logistics processes and implementation of intelligent transport systems. This suggests that a rather narrow transport segment of the virtual labor market has the potential to grow and develop in the near future.

sixthly, the SWOT analysis concluded the upward trajectory of the labor market development in the long term. However, as the authors believe, in order to move to a new level of development, it will be necessary to create and apply new adaptation tools that are absent today. We are talking about the creation of an institute of social protection of economic entities using flexible forms of hiring, an institute of continuous education for freelancers, an institute of state regulation of the virtual labor market, including legal regulation of employment in digital form, regulation of relations between the customer and the contractor (independent contractor) through digital platforms and etc.

The authors of the study admit the controversial nature of the results obtained due to the novelty of the topic and the lack of statistical information. We invite the expert community to discuss in more detail the criterion characteristics of the virtual labor market in order to obtain generally accepted knowledge regarding a clear definition of its boundaries, proposals on possible principles and methods of its state regulation, assessment of its potential and development trajectory, as well as effective forms of convergence with the traditional labor market.

In our opinion, it deserves a theoretical justification the problem of interaction between the virtual labor market and the market of transport and logistics services in order to identify the sectoral features of adaptation mechanisms.

5. Conclusions

The evolutionary and not very rapid development of the virtual labor market in the Russian Federation, the emergence of which was objectively caused by the processes of digitalization and globalization, was interrupted by

References

Lapidus, L.V., Polyakova, Yu..M., 2018. Gigonomics as a new socio-economic model: development of freelancing and crowdsourcing. Bulletin Shokhina, E., 2021. The number of companies in Russia is steadily decreasing. https://www.vedomosti.ru/economics/articles/2021/01/20/854868-kolichestvo-kompanii, last accessed 2021/05/13.

Sadovaya, E.S., 2018. The digital economy and the new labor market paradigm. World economy and international relations 62(12), 35-45.

Dube, A., Jacobs, J., Naidu, S., Suri, S., 2020. A Monopsony in Online Labor Markets. American Economic Review: Insights 2(1), 33-46.

Banik, N., Padalkar, М., 2021. The Spread of Gig Economy: Trends and Effects. Foresight and STI Governance 15(1), 28–38. DOI: 10.17323/2500-2597.2021.1.19.29.
the shocks of the pandemic and the associated economic recession. Stress factors (negative) of the current situation have formed new behavioral patterns and trends, revealing the adaptive potential of the virtual labor market. We propose to consider the extraordinary and rapid changes that have occurred in the virtual labor market in 2020 as an innovative adaptation. It was based on the factors of adaptation, the action of which contributed to the creation of conditions for the active inclusion of a virtual worker in the innovation process based on professional development and intensive use of information and communication technologies.

Nowadays, there is uncertainty about the future pace of development of the virtual labor market in the Russian Federation due to the persisting impact of the pandemic on the country's economy, conservatism in the existing institutional principles and norms, the lack of accurate data on its boundaries and potential. But in any case, we can say that the virtual labor market in the Russian Federation was able not only to neutralize the shocks of the pandemic and crisis in the short term, but also by revealing its adaptive potential, it turned out to be able to create the preconditions for a long-term trend of its development in the direction of flexibilization, intellectualization and institutionalization.

References

Aneesh, A., 2008. Virtual Migration: The Programming of Globalization. Durham; L.: Duke University Press, p. 208.
Banik, N., Padalkar, M., 2021. The Spread of Gig Economy: Trends and Effects. Foresight and STI Governance 15(1), 28–38. DOI: 10.17323/2500-2597.2021.1.19.29.
Chandler, S., 2020. Coronavirus turns uber into gig platform for all work. Forbes. https://www.forbes.com/sites/simonchandler/2020/04/07/coronavirus-turns-uber-into-gig-platform-for-all-work/#4f9ea64b1db9, last accessed 2021/05/11.
Dubé, A., Jacobs, J., Naidu, S., Suri, S., 2020. A Monopsony in Online Labor Markets. American Economic Review: Insights 2(1), 33-46.
Gokhberg, L.M., Rudnik, P.B., Vishnevsky, K.O., Zinina, T.S., 2021. Digital transformation of industries: starting conditions and priorities: report of National Research University Higher School of Economics. M.: Ed. House of the Higher School of Economics, p. 239.
Horton, J., et al., 2018. Digital Labor Markets and Global Talent Flows. High-Skilled Migration to the United States and Its Economic Consequences. Chicago: University of Chicago Press, pp. 71-108.
Lapidus, L.V., Polyakova, Yu..M., 2018. Gigonomics as a new socio-economic model: development of freelancing and crowdsourcing. Bulletin of the Institute of Economics of the Russian Academy of Sciences 6, 73-90.
Loktyukhina, N.V., Chernykh, E.A., 2020. Dynamics and quality of platform employment in the era of coronavirus: challenges for Russia. The standard of living of the population of the regions of Russia 16, 4(150), 80-95.
Nikishov, S., 2021. Intellectualization of logistics processes. National Association of scientists 63, 40-42.
Sadovaya, E.S., 2018. The digital economy and the new labor market paradigm. World economy and international relations 62(12), 35-45.
Sanchis-Pedregosa, C., Machuca, J.A.D., González-Zamora, M.-d., 2018. Determinants of success in transport services outsourcing: empirical study in Europe. The International Journal of Logistics Management, 29(1), 261-283.
Sautkina, V.A., 2020. Virtual employment: new opportunities and risks. Social and Labor Research 39(2), 57-68.
Schislyaeva, E.R., Sharipova, S.R., Balashova, E.S., Sychenko, O.A., 2020. The mechanism of creating a strategy of sustainable development of company in the eco-system of the digital economy. Advances in Intelligent Systems and Computing 1100, 131–138. DOI: 10.1007/978-3-030-39319-9_14.
Shokhina, E., 2021. The number of companies in Russia is steadily decreasing. https://www.vedomosti.ru/economics/articles/2021/01/20/854868-kolichestvo-kompanii, last accessed 2021/05/13.