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DEVELOPMENT OF OIL AND GAS SERVICE AS ORGANIZATIONAL FORM OF ENTREPRENEURSHIP IN POST-INDUSTRIAL ECONOMY

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The article is devoted to the problem of development of oil and gas service. The transformation of the oil and gas sector with the separation of independent enterprises and organizations providing services in the oil and gas service sector is compared by the author with the trend of rapid development of the service sector in the postindustrial economy. The purpose of the study is to identify the general and specific characteristics of modern oil and gas services and to determine the directions for the transformation of organizational forms of entrepreneurship in the sphere under consideration. The growth of quantitative parameters of the oil and gas services market has been analyzed. The classification of this market is proposed depending on the place of services in a single technological cycle in relation to the main oil production process. The positive consequences of the development of oil and gas services for the development of oil and gas production have been systematized. Basic organizational models of entrepreneurship development in oil and gas service are generalized and substantiated. It is shown that the main influence in the market of services is taken by vertically integrated national oil and gas companies, as well as by international companies that provide service support for the work of Russian oil and gas companies. The results of a comparative analysis of advantages and disadvantages of organizational models of entrepreneurship in the field of oil and gas services are presented. It is proved that oil and gas service as an organizational form of entrepreneurship in its development reflects the general trends of the post-industrial economy. Specific features of oil and gas service in Russia are singled out. The revealed directions of transformation of organizational forms of entrepreneurship in the sphere of oil and gas service in current conditions can be used in the formation of state programs in the field of industrial development, the high-tech sector, and in working out strategies for the development of enterprises and organizations providing services in the oil and gas sector.

Key words: oil and gas service, service sector, post-industrial economy, entrepreneurship, high-tech services

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Introduction. The transition to a post-industrial economy is, first of all, characterized by rapid development in the structure of the world economy of the service sector. The tendency to increase the share of revenues from services in GDP was manifested in the developed countries in the 60-70's of the XX century. By 1995, the service sector had reached 66 % of GDP in countries with a high level of development, 52 % – with an average and 35 % – with a low level of development (StatisticsTimes.Com). At present, 63.5 % of world GDP is produced in the services sector. The largest producer of services (about 13.5 trillion dollars) are the United States. The services sector surpasses the share of GDP in industry and agriculture in 194 countries all around the world, and in 30 of them 80 % of GDP is comprised of the service sector. In the Russian Federation, the share of services in GDP for the first time exceeded the share of goods in 1994, and in 2010 amounted to 66 % compared to 32 % in 1989 (www.gks.yu), while the share of people employed in the services sector was in 2014 65.8 % against 64.4 in 2010 and 45 % in 1990 (worldbank.org).

However, the development of the service sector does not eliminate the need for material goods created in material production. A more detailed analysis shows that changes in the structure of social production and the growing role of the service sector in the social division of labor are associated with several trends, the most important of which is the intellectualization of services and the increase in their science intensity. This leads to the transformation of the organizational forms of entrepreneurship, which, in an effort to reduce production and, mainly, transaction costs, is looking for ways to increase the flexibility of its production activities. The solution lies in the disaggrega-

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tion of industrial companies, in their outsourcing of supporting and servicing processes, in general, separate functions of the enterprise, such as research and development, marketing, engineering, financial services, etc. [16].

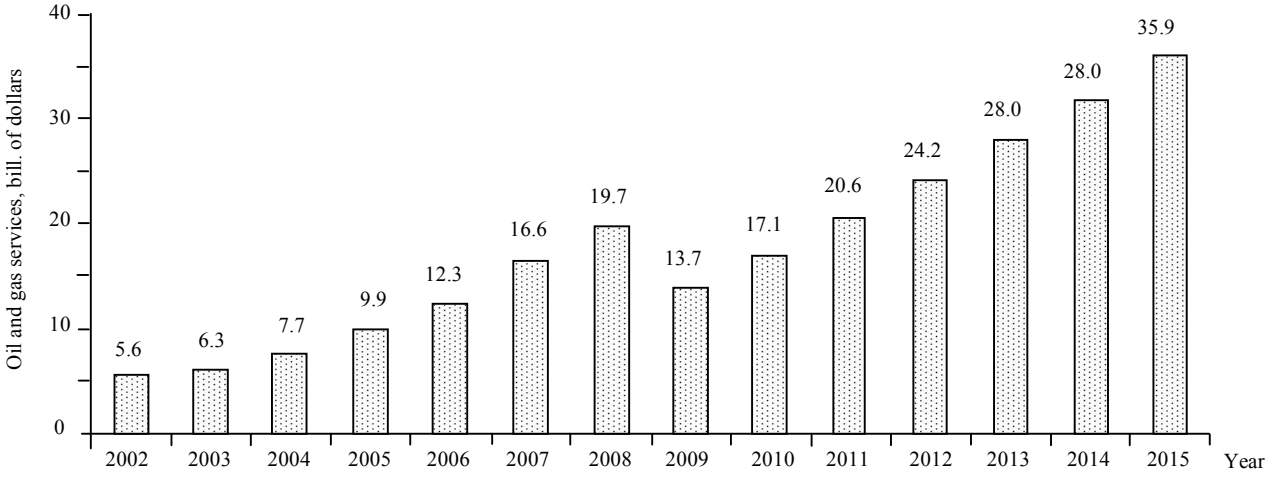
Further development and advancement of the sphere of services is accompanied by the appearance of completely new types of services, confirming the interconnection of the sphere of services and material production. The service sphere covers a significant number of activities, the boundaries of which do not always coincide with the borderlines of the branches of the economy [11, 15]. This situation was reflected in the new version of the All-Russian Classifier of Types of Economic Activities «All-Russian Classifier of Economic Activities» OK 029-2014 (NACE Rev.2), where in section B – «Mining» we find subsection 09 – «Provision of services in the field of mining», and in section C – «Processing industries» we find subsection 33 – «Repair and installation of machinery and equipment», etc.

Formulation of the problem. The abovementioned trends can also be observed in the oil and gas industry, which composition can now be summarized as the sum of two important components: oil and gas production, and oil and gas services, which are part of a unified technological and logical cycle of the oil and gas industry [6]. The analysis of the state and the determination of the factors and prospects for the development of the oil and gas sector of the national economy and the world as a whole at the present time, in the author's opinion, cannot be complete without taking into account the tendencies of the emergence of a post-industrial type of economy, which, in comparison with the industrial type, has a different technological, resource and organizational basis. By relying on the results obtained in the field of research on the transformation of organizational forms of entrepreneurship we will be able to make more informed decisions in the sphere of strategic management of oil and gas service enterprises.

In addition, the oil and gas sector in general and oil and gas services in particular have specific characteristics that distinguish them from other types of service activities. For example, oil and gas service has a special significance in the field of economic and environmental security of the national economy, etc. The study of these and other features in turn can create the prerequisites for the further development of the theory of the post-industrial economy in terms of its service components.

This article is devoted to identifying the general and specific characteristics of oil and gas services and determining the direction of transformation of organizational forms of entrepreneurship in the oil and gas service in the conditions of the post-industrial economy is devoted to this article.

Methodology. We have used the methods of generalization, systematization, comparative analysis, and statistical methods of data processing.



Dynamics of oil and gas services market development in Russia

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Table 1

Types of oil and gas services in relation to oil and gas production [5, 8]

Place of service in relation to production process	Example
Ex ante	Geological exploration, including seismic research and geophysical work
	Capital construction of infrastructure (roads and other facilities)
	Construction of oil and gas wells
In-service control	Well drilling and support works
	Service maintenance of oil production equipment
	Services of technological and general transportation
	Enhanced oil recovery activities
Ex post	Overhaul of oil wells and equipment
	Nature protection activities

Discussion. The total volume of the oil and gas service market in Russia is estimated at about $ 40 billion (see Figure), with a tendency to increase due to the growing technological complexity of oil and gas production in the context of the need to develop new oil and gas provinces [3].

At present, the oil and gas sector includes enterprises and organizations whose main activity is the provision of services that provide and accompany production activities in the oil and gas sector. In Table 1, these services are divided into three groups, depending on the stage of oil and gas production. As the data in the table show, oil and gas service covers the entire technological cycle and currently became an essential element of it.

In the opinion of many researchers [1, 2, 5, 8, 10, 13-14], the transition of supporting and non-profile activities in the oil and gas sector to service maintenance is very promising, since it allows:

– to reduce the cost of oil production, since more than 25 % of direct costs in the structure of producing cost of oil account for the cost of service itself;

– create prerequisites for involving in turnover the field deposits with hard-to-recover reserves, as well as conserved wells;

– to increase the reliability and safety of the operation of technological equipment and the level of maintenance works;

– to increase the capitalization of the oil company by solving the problems of improving the organization issues concerning production processes;

– to provide conditions for the formation and development of small and medium-sized oil and gas producing companies in a competitive environment.

The overall generalization of existing approaches [1, 4-5, 9, 10] allows to distinguish three basic organizational models of development of entrepreneurship in the oil and gas service:

– vertically integrated national oil and gas service;

– oil and gas service provided by large international companies;

– independent national oil and gas service.

The first organizational model of development of entrepreneurship in oil and gas service suggests that the company uses its own divisions to provide the main oil and/or gas production with supporting services. According to some estimates, the share of the market for services of vertically integrated oil companies makes up 30-40 % of the oil and gas service market. Examples of Russian oil and gas companies operating within the framework of the first model include PTC «Gazprom», PTC «Gazprom Neft», OJSC «Surgutneftegaz», PTC «Tatneft», and others.

The formation of the second organizational model for the development of entrepreneurship of the oil and gas sector reflects the penetration of large foreign service companies that provide oil and gas services to the Russian market. These include «Schlumberger», «Halliburton», «Baker

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Table 2

Comparative analysis of advantages and disadvantages of organizational models of entrepreneurship for companies (organizations and their subdivisions) of Russian oil and gas service sector

Models	Advantages	Disadvantages
Vertically integrated national oil and gas service	Inaccessibility of the domestic market of the parent company for competitors, which guarantees the stability of the cost price of the provided services Provision of required technology and technological equipment Availability of substantial employment benefits for staff members	The presence of non-core assets that reduce the level of capitalization of the company Strict tailoring of service enterprises (divisions) to the requests of the parent company, which reduces the possibility of development in other areas The higher cost price of a number of services in comparison with other models
Oil and gas service provided by large international companies	Provision of access to advanced science-based technology for Russian consumers Possibility to share experience in the field of service companies' management	Increasing the technological backlog of Russian service companies' due to insufficient funding of relevant research and almost complete absence of transfer system for technologies of transnational companies into Russian ones Risks of takeover of Russian independent companies The decline in the level of economic security of the country due to the significant presence of foreign capital
Independent national oil and gas service	Independence of service companies in selecting partners and terms of contracts Possibility of full load of available capacities Flexibility and mobility in adapting to the market conditions	Limited investment and intellectual resources Relatively low range of provided services The difficulty in providing the required level of quality due to insufficient technical equipment

Hughes», «Weatherford», which have production bases, research centers, as well as their own equipment production and provide a wide range of services to Russian oil and gas companies operating in various geographical areas, including Western Siberia, the Republic of Komi, Sakhalin and Eastern Siberia.

The third organizational model of development of entrepreneurship in the oil and gas service involve the separation of service structures from independent Russian oil and gas enterprises into independent businesses. The preconditions for the emergence of independent Russian enterprises on the oil and gas service market were created by the processes of releasing oil and gas production enterprises from non-core assets in the 1990s and the early 2000s.

The advantages and disadvantages of all three organizational models of entrepreneurship in the oil and gas service for service enterprises (organizations and their subdivisions) are presented in Table 2.

The advantages and disadvantages listed in the table have caused the situation when the Russian oilfield service is currently represented by 300 companies, which can be grouped as follows [7]: subdivisions of vertically integrated oil companies; large international companies; large Russian service companies, including those with involvement of foreign capital, for example LLC «Drilling Company «Eurasia»; small and medium-sized Russian service companies. Calculations show that currently about 30 % of the volume of oil and gas service is performed by independent private, state and public-private Russian companies [5].

Oil and gas service as an organizational form of entrepreneurship in its development reflects the general trends of the post-industrial economy. Complications of the conditions of oil and gas production leads to an increase in the share of high-tech services [6, 7], which is provided by oilfield service companies by deepening the division of labor, the possibility of attracting highly qualified specialists, etc. At present, such service companies are one of the main factors in the innovative development of

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the oil and gas complex in Russia, ensuring the stabilization of production in the old oil-bearing areas, accelerating the involvement and development of low-margin fields [4]. Similar risks for the disaggregation of companies and identification of independent activities are the risks accompanying the transformation of the organizational model of entrepreneurship. These should be attributed to the disadvantages of the third model (Table 2).

At the same time when choosing the organizational models of entrepreneurship in the sphere under consideration, it is necessary to take into account the specific features of oil and gas service. The most important among them are [6] provision of energy, ecological [17], national, economic security of the country, as well as implementation of geopolitical and geo-economic goals and tasks of the state [16], implying that Russia's confident presence in the oil and gas market will allow it not only to expand the export of high-tech products, but also significantly strengthen the country's economic and geopolitical position.

Conclusions

The analysis of conditions and major trends in development of oil and gas service in Russia allows to make the following conclusions:

1. The separation of services in the oil and gas industry corresponds to the general trend in the development of the service sector in the postindustrial economy and is confirmed in the world and Russian economic practices.

2. The formation of independent organizational models of oil and gas services is conditioned by the increasing complexity of hydrocarbon production conditions, which requires knowledge-intensive, high-tech services provided by large specialized companies. This leads to a change in the structure of the oil and gas sector in favor of oil and gas services, and this trend will increase in the short-term perspective.

3. The specifics of the development of oil and gas services in Russia are due to the specialization of the national economy into mineral resources area, the existing tendencies of monopolization, and the need to solve geopolitical tasks in the current political situation.

4. The revealed directions for transformation of organizational forms of entrepreneurship in the sphere of oil and gas service in current conditions can be used in the formation of state policy in the field of industry, the high-tech sector, and also in the development of strategies for the development of enterprises and organizations providing services in the oil and gas sector.

REFERENCES

1. Antropova A.S. Efficiency of business models for the development of oil and gas services in Russia. Korporativnoe upravlenie i innovatsionnoe razvitie ekonomiki Severa: Vestnik nauchno-issledovatel'skogo tsentra korporativnogo prava, upravleniya i venchurnogo investirovaniya. Syktyvkarskii gosudarstvennyi universitet. 2015. N 1, p. 27-39 (in Russian).

2. Kurbanov A.Kh. Typologization of the factors responsible for the transition to outsourcing in the oil and gas industry. *Problemy ekonomiki i upravleniya neftegazovym kompleksom*. 2012. N 8, p. 12-15 (in Russian).

3. Bushuev V.V., Kryukov V.A., Saenko V.V. et al. Russian oil industry – scenarios of balanced development. Institut energeticheskoi strategii. Moscow: IATs «Energiya», 2010, p.159 (in Russian).

4. Pavlovskaya A.V. The efficiency of drilling operations in the branch of LLC «Gazprom burenie» «Ukhta burenie» in the conditions of service. *Resursy Evropeiskogo Severa. Tekhnologii i ekonomika osvoeniya*. 2016. N 1 (3), p. 53-62 (in Russian).

5. Pavlovskaya A.V., Antropova A.S. Problems of development of oil and gas service in Russia. *Problemy ekonomiki i upravleniya neftegazovym kompleksom*. 2013. N 8, p. 4-10 (in Russian).

6. Parakhina V.N., Al'-Sarori Kh.A.M. Factors of the efficiency of the oil and gas industry. *Ekonomika: vchera, segodnya, zavtra*. 2013. N 9-10, p. 21-39 (in Russian).

7. Tokarev A.N. Oil and gas service as a basis for innovative development of oil and gas industry. *Sibirskaya finansovaya shkola*. 2014. N 4 (105), p. 91-99 (in Russian).

8. Tomazova O.V. Formation and development of oil and gas service. *Vestnik Samarskogo gosudarstvennogo tekhnicheskogo universiteta. Seriya: Ekonomicheskie nauki*. 2013. N 2 (8), p. 141-146 (in Russian).

9. Shraer A.V. Business models for development of oil and gas service in Russia. Rossiiskoe predprinimatel'stvo. 2011. N 10, p. 107-112 (in Russian).

10. Abdelsalam H.M., Sadek M., Gamal S. Potential knowledge process outsourcing of Egyptian oil and gas engineering services industry. *International Journal of Knowledge-Based Development*. 2013. Vol. 4. Iss. 4, p. 338-362.

11. Benyoussef Zghidi A. Benyoussef A., Zaiem I. Service orientation as a strategic marketing tool: the moderating effect of business sector. *Competitiveness Review*. 2017. Vol. 27. Iss.1, p. 40-61.

12. Rubtzov V.A., Rozhko M.V., Gabdrakhmanov N.K., Pratchenko O.V., Trofimov A.M. Economic-geographical aspects of competitiveness and positioninng of countries and regions. *Mediterranean Journal of Social Sciences*. 2015. Vol. 6. Iss. 3, p. 741-745.

13. Kumar R., Markeset T. Development of performance-based service strategies for the oil and gas industry. *Journal of Business and Industrial Marketing*. 2007. Vol. 22. Iss. 4, p. 272-280.

14. Kumar R., Markeset T., Kumar U. Implementation and execution of industrial service strategy: A case study from the oil and gas industry. *Journal of Quality in Maintenance Engineering*. 2006. Vol. 12. Iss. 2, p. 105-117.

15. Na J., Lee J.-D., Baek C. Is the service sector different in size heterogeneity? *Journal of Economic Interaction and Coordination.* 2017. Vol. 12. Iss. 1, p. 95-120.

16. Pattinson S. Strategic thinking: Intelligent opportunism and emergent strategy – the case of Strategic Engineering. *International Journal of Entrepreneurship and Innovation*. 2016. Vol. 17. Iss. 1, p. 65-70.

17. Rumyantsev A.A. Post-industrial technological mode of production: Theory, economic and environmental features, discussion questions. *International Journal of Economics and Financial Issues*. 2015. Vol. 5. Iss. 3S, p. 194-201.

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