Economic Benefits and Costs of Platform Solutions in the Modern Development of Natural Resources of the Russian Arctic

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Abstract. The article describes a new platform business model for the development of natural resources in the Arctic, which had emerged in recent decades and replaced the conveyor model of large industrial mining plants of the Soviet era. Using the example of new resource projects in the Russian Arctic, we analyze its main advantages associated with high adaptability, labor productivity, innovation, widespread use of artificial intelligence technologies, and the disadvantages associated with extraterritoriality and social alienation from the territory of presence. The role of the state in these conditions is analogous to the role that the branch trade unions had played in the industrial era: it is to protect labor over capital. We are talking about the formation of the state regulation of corporate social responsibility in the Arctic, about the use of the institution of social license for the company, which has proved its efficiency abroad, partnership agreements with the municipal and regional authorities of the Arctic territories. Contemporary priorities of the public policy in the Arctic, which are aimed at raising the level of real incomes of its residents to the national average and helping to attract private investment in the Russian Arctic, do not in any way work to correct the imbalances between labor and capital arising in the platform business model.

1. Introduction

In recent decades, many works have been published devoted to the emerging new post-industrial order based on information technology, knowledge-intensive services and electronic communication and its multifaceted impact on society, its values, and employment structure [1-9]. However, there are practically no studies in which this phenomenon had considered on the example of very specific Arctic regions. This work is one of the first in this regard. The object of the research is the phenomenon of the platform as a relatively new business model, which replaces the conveyor one and gradually becomes dominant throughout the world, and in recent years has arisen in the Russian Arctic, in the course of the new development of its mineral resources.

The aim was to characterize the platform as a new business model for the development of the Russian Arctic, to give it a balanced assessment. This goal determined the solution of three main tasks: 1) describe the economic benefits of the platform and platform solutions for the development of the Arctic; 2) determine the economic costs of these innovations; 3) formulate new priorities for state policy in the Arctic in the era of digital technologies and electronic communication. The informational basis of the
work was the analysis of the implementation of dozens of new projects in the development of natural resources in the Arctic.

2. What is a platform as a new business model?
An absolutely new economic phenomenon is emerging in the Russian Arctic, based on a fundamentally new business model, new technology and communication. This conclusion is confirmed by examples of the construction and operation of the Prirazlomnaya platform, which produces hydrocarbons on the shelf of the Pechora Sea, the Novoportovskoye oil field in the Yamal-Nenets Autonomous District, the Yamal-LNG and Arctic-LNG-2 projects in the Yamalo-Nenets Autonomous Okrug, the projects for the development of the Kupol and Dvoinoe gold deposits in Chukotka Autonomous Okrug, a project for the development of the Pavlovskypolymetal deposit on Novaya Zemlya. All of them are based on the localization of economic activity, network communication of each participant with each other, block-modular technologies and rotational organization of labor, and are radically different from others implemented in the traditional model of economic development of industrial time.

The necessary conceptual generalization of this new model is provided by the book [8], in which this phenomenon is characterized from a global perspective.

The common features of the platform as a new business model and platform solutions are its ability to collect, process and control colossal data sets inaccessible to any previous model. This is ensured through the total digitalization of all business processes, the use of Internet of Things technologies, artificial intelligence, remote control, and unmanned technologies.

In the business model of the platform, instead of linearly organized technological processes, polycentric, network organization becomes the rule; instead of hierarchical control, internal control of the employees themselves is characteristic; instead of significant production inventories - work from wheels when adapting products for numerous groups of consumers; instead of giant production teams - robots and a small number of operators; instead of guaranteed life-long employment - temporary contractors and contractors. Small and medium-sized businesses of Arctic regions in the initial stage of the implementation of projects for the development of hydrocarbon fields are able to perform a range of work required. This is the construction of access roads and internal roads, drilling and blasting, the construction of moorings, crushing and moving rocks, sand reclamation, all electrical work for temporary power supply for the construction period, the construction of networks and communications for temporary and permanent buildings and structures [10].

3. What are the features of platform solutions in the Arctic?
The digital economy is emerging in the Russian Arctic faster and more extensively precisely in platform solutions. They are initiated by the resource-producing companies Gazpromneft, NovaTEK, Norilsk Nickel, Lukoil and others.

For the Arctic, land and resource issues are key. Therefore, platform solutions primarily affect the control of land, license areas, property rights to natural resources. If for the developed regions of Russia and the world, the platform business model is a speculative phenomenon, invisible to the eye, but detected as a result of the analysis of social relations; then for the Arctic it has visual objectivity. These are sea or land “island” platforms located in the off-road isolated territories. In the area of the main settlement, these production platforms are often directed to the domestic market, and in the Arctic, the resources produced on such platforms are focused exclusively on the external, global market.

Within the Arctic production platforms, three types can be distinguished: oil and gas offshore platforms; onshore platforms for localized development of mineral resources; production platforms on the arctic islands. Despite the fact that in each case we are talking about completely different industries, they are all essentially united by the total digitalization of all business processes, reliance on electronic communication and remote control, unmanned technologies and island localization.

A peculiarity of the modern development of the Russian Arctic is that in it simultaneously coexist new platform models of business processes and the old conveyor business processes, with their inherent logistics schemes, personnel policy, industrial technologies. For example, the development of the
Bovanenkovskoye field by Gazprom is proceeding according to the usual scheme of the late Soviet times, with land logistics; on the other hand, the Arctic LNG-2 project of the NovaTEK company is being implemented already in the new platform ideology of the industrial Internet and the dominant digitalization and electronic communication and is based on maritime logistics. It is interesting to compare the old and new schemes for the development of natural resources in the Russian Arctic (Table 1).

Table 1. Comparison of "conveyor" and "platform" solutions for the development of Arctic resources.

| Relations in production process | Conveyor-typesolutions | Platform-typesolutions |
|--------------------------------|------------------------|-----------------------|
| A vertically integrated production-processing-sales structure. Some or all of the service divisions are within the company | A network structure of autonomous production centers linked into one digital network. Cross-subsidization of business units. Most of the service departments are outside the company (outsourcing to external contractors) | Northern sea route for the export of natural resources to European and Asian markets. |
| Logistics | The southern land route for the export of the extracted natural resource through pipelines, railways, etc. | “Sales and purchase contract”: reliance on temporary contract workers in low-skilled personnel (outsourcing of employees), the company's labor market for recruiting executives, local personnel and company personnel for recruiting middle managers |
| Labor relations | “Employment contract”: permanent employment of workers, the formation of workers at all levels from local personnel (the phenomenon of working dynasties) | |
| Relations with the Arctic territory of activity | The division of the company is the city-forming enterprise of the monotown. Strong ties with the local community. Active use of local personnel, including the indigenous small-numbered peoples of the North | The division of the company is a rotational production camp. Weak interaction with the local community and poor use of its human resource potential. Corporate social responsibility programs of the company within the framework of agreements on social and economic partnership with the territory of presence |
| Economic development model | From scratch, creation of a hierarchical system of external and internal bases and development routes (linear-nodal territorial framework), district (inter-district) territorial industrial complex | Reliance on the previously created infrastructure and settlement network, a polycentric network of equivalent development bases, localized production clusters (SEZ etc.) |
| Degree of social embeddedness | High | Low |
| Extraterritoriality of the company's capital | Low: the enterprise is implementing a large-scale and capital-intensive site development program | High: the profit generated at the place of production flows to the company's headquarters and / or offshore |

In contrast to the previous conveyor production, organized in the ideology of a linear production chain (which is clearly seen on the example of old production facilities of the Norilsk Combine), extremely spatially extensive, extended in communication - new platform production is extremely
compact, which is greatly facilitated by block-modular and significantly smaller in size technologies for organizing a physically compacted and compressed workspace.

On the one hand, new platform projects almost always rely on the already created infrastructure and nearby development bases at the construction stage; on the other hand, they are separated from them at the operational stage in the form of a separate production capsule, an economic island. Disunity from the place of deployment allowed us to diagnose, for example, in the Nenets Autonomous Okrug the presence of NAO-1, with a historically created settlement system, and invisible on maps, NAO-2 with shift camps, heliports of oil and gas corporations that are developing here (Figure 1).

\[\text{Figure 1.} \quad a) \quad \text{a fragment of the corporate settlement network in the eastern part of the okrug, “empty” from the point of view of official statistics (Yandex maps);} \]
\[\text{b) the same site on the planning scheme at the NAO GIS portal}^{1} \quad \text{: Source - Zamyatina N.Yu. Working materials for the Strategy of Socio-Economic Development of the Nenets Autonomous Okrug.} \]

The new typical employee in the platform business model is either a temporary shift worker or a robot. Therefore, the share of shift workers is indirect evidence of the transfer of business processes to a platform type, which is exclusively characterized by inconsistent, non-guaranteed employment.

\[^{1}\text{http://gisnao.ru/apps/terplan/}\]
Another attribute of new platform solutions is the active use of the Arctic seas and rivers for the delivery of equipment at the stage of setting up a new project and for the export of finished products [11]. Previous industrial logistic schemes relied on land pipeline or rail transportation of extracted natural resources. The use of marine schemes had been the exception and not the rule. In the new projects in the Arctic that have arisen in the past 30 years, maritime logistics has become dominant due to climate mitigation, a decrease in the amount of ice and new technological possibilities for the construction of vessels of a reinforced ice class. This new logistic is tightly integrated with new platform solutions. Due to provide a safety of the industrial complexes and to prevent negative ecological impact on a vulnerable arctic environment that is crucially necessary to implement in each exploiting field the modern high sensitive subsea fiber optic systems for seismoacoustic monitoring of the both fluidodynamic regime and geomechanical conditions in depths [12].

The ideal corporate scheme for the modern development of Arctic resources is: a completely separate autonomous production platform on which the production and processing processes are deployed, with unmanned technologies, remote control of all production processes [13].

4. Economic benefits of platform solutions
All new projects in the Arctic, implemented on the principles of platform technologies and solutions, are united by an exceptionally high level of labor productivity due to the innovativeness of the technological solutions adopted, environmental friendliness due to the extreme localization of the impact on the natural environment, and industrial comfort for workers. Using the achievements of the industrial Internet means the total digitization of all business processes and the massive introduction of sensors and computer chips into the production process and trackers into the logistics process.

The speed of deployment of new high-tech projects in the Arctic is impressive. When an economic decision is made on them, political approval is obtained at the highest level, they are deployed at a speed unprecedented and impossible in the previous industrial model, using the best world achievements in every business process and technology. The energy of private initiative makes it possible to move the project extremely quickly from the design stage to the construction stage and then operation. Pervasive innovation and technological fearlessness in manufacturing and logistics are becoming the rule.

The integral features of the platform as a new model of the Arctic business is the creation of its own ecosystem, consisting of extracted natural resources and production, logistics, information services that are not available to competitors. Therefore, it is absolutely no coincidence that NovaTEK strives not only to become a Russian monopoly in the production of Arctic liquefied natural gas, but also to be a monopoly in its supply to foreign markets, collecting all the necessary services for this, including transshipment bases from ice-powered gas carriers to the usual class; Gazpromneft's aspiration for as many corporate users of the Northern Sea Route as possible to join its Captain digital navigation system.

5. Economic costs of platform solutions
As in the case of other innovations, the introduction of new platform technologies at the first stage means a temporary victory of capital over labor and inevitable initial infringements of the rights of the worker. In this regard, one can recall the work of F. Engels on the Luddites - the first spontaneous actions of workers at the turn of the 18th and 19th centuries against the massive introduction of machines [14].

A fundamental feature of the platform compared to all previous innovations is that it does not simply enhance the exploitation of the few workers who are involved in it. Due to the large-scale introduction of robots and artificial intelligence technologies, it turns labor itself into a rare luxury available only to a selected few. The ideal of a corporation that has switched to a platform-based business organization model is production with no people at all or without permanent employees (one remote operator for equipment located in the Arctic; shift workers on Arctic projects whom the corporation does not need to pay northern bonuses).

But this means that even a few growth poles - new development projects in the Russian Arctic - do not provide the territory and its inhabitants with the necessary income stream in the form of salaries and salary bonuses. This leads to growing inequality within the Arctic itself (between growth poles and
depression poles, between local skilled workers employed on platforms and local unemployed, etc.). And this fully fits into the diagnosis of modern society made by T. Piketty in his work [7]: the growth of social inequality had occurred throughout the 20th century, with the exception of a short period of post-war recovery of the world economy.

Many researchers [15, 16] note the extraterritorial nature of modern mining enterprises in the North and the Arctic, their alienation from the territory of presence: the main decisions are made at headquarters, profits are concentrated in off-shores, which are located far from the mining areas, where the main profit of these companies is created.

However, no one associates these new features of mining enterprises with platform technologies and platform solutions. We argue that there is a direct connection between them: the more a company implements a platform model of business organization, the more it turns out to be alienated from the territory of its presence by the generated profit, employment structure and extremely compact placement in the territory. The phenomenon of the extraterritoriality of resource corporations in Russia, which has emerged since the 1990s, is directly related to the introduction of platform technologies of big data, total digitalization and electronic communication.

Platform technologies lead to a weakening of the position of labor in the dispute with capital: innovative solutions provide a significant release of workers and a relative redundancy of labor, on the one hand; on the other hand, the self-confidence of the owners of advanced technical means and capital, who hold monopoly positions in the modern economy.

Instead of the previous direct benefits in the form of new employment and a stream of income to the Arctic territory of presence, a new scheme is emerging, when the main local bonuses are formed from local taxes from a new project and through corporate social responsibility programs. However, these bonuses do not have the same assurance and stability that were previously provided by employment from a long-term, sometimes for many decades, mining enterprise.

Benefits from new projects are very weakly "poured" into the territory of presence and the state is forced to budgetary support in increasing volumes of the Arctic and northern territories, in which the main export income of the country and a significant part of the budget income and gross national product are generated. Platform solutions create these diverging scissors between generated revenue and the well-being of the mining area and its residents.

6. Conclusion: what is to be done?
In recent decades, a new trend has emerged in the development of Arctic resources by corporate platform-type structures. The new business model, along with economic benefits for the economies of Russia and the Arctic, the benefits of innovation, digital technologies and electronic communication, brings with it significant social costs for the production area in the form of the company's extraterritorial behavior. The guaranteed and long-term hiring of local workers on new resource projects, which was characteristic of the previous "conveyor" model of Arctic development, is being transformed into outsourcing of labor in the form of hiring temporary shift workers and attracting qualified personnel and management personnel from the labor market of the company itself.

It is impossible to reverse the existing model of the development of the Russian Arctic. The task is to compensate for the costs of a radical and unprofitable for the Arctic territories new contract with the corporation. But this cannot be done without an active and innovative role of the state.

The modern search for ways to compensate for the costs of platform development is carried out by the state in the coordinates of "guarantees to achieve the national average living standard for the Arctic at the expense of federal budgetary resources", in the coordinates of "attracting private investment" in the Arctic territories. Without denying the positive nature of the measures mentioned (although the territory may not receive tangible benefits from these approaches), we note that the main direction of public policy should be different. This is an active influence on the economic behavior of companies in the Arctic, ideally - the formation of state regulations for the behavior of public and private companies in the Arctic, which will spell out measures and mechanisms that compensate and neutralize the costs
of social exclusion and extraterritoriality. This will be a real protection of labor in a dispute with capital, similar to that provided by branch unions in the industrial conveyor era.

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