

TRANSFORMATION OF RESOURCE DISTRIBUTION PROCESSES DRIVEN BY DIGITAL TECHNOLOGIES

^aDMITRY V. SUKHODOEV, ^bLYUDMILA F. SUKHODOEVA, ^cDMITRY YU. VAGIN, ^dNADEZHDA L. SINEVA, ^eELENA V. YASHKOVA, ^fJULIA N. ZHULKOVA

^{a, b}National Research Lobachevsky State University of Nizhny Novgorod, Gagarin Avenue, 23, Nizhny Novgorod, Russia, 603950

^{c, d, e, f}Minin Nizhny Novgorod State Pedagogical University, Ulyanov str., 1, Nizhny Novgorod, Russia, 603005
email: ^afindir-55@yandex.ru, ^bkommercia@bk.ru, ^c403485@mail.ru, ^dSineva-nl@rambler.ru, ^eElenay2@yandex.ru, ^fzhulkova@mail.ru

Abstract: The paper looks into the key characteristics of transformation of the resource management processes for the companies. A mechanism has been elaborated for resource management based on digital technologies to support the companies' business development programs. The new approaches are proposed to intercompany cooperation aiming to create digital models for managing business development. A system is proposed for intercompany cooperation in digital economy intended to facilitate effective decision making for prudent distribution of resources. Among the identified major challenges is the low efficiency of the procedural framework guiding the distribution resources. It has been demonstrated that the use of digital technology becomes the main benefit of close coordination of all resource sources at all levels of management.

Keywords: resource substitution, resource potential, transformation, digital economy, modeling, quality of resources, control over resource management.

1 Introduction

The transformation of resource distribution processes is associated with the creation of new nano-resources and having resource sources assigned to specific consumers (Zhiltsova & Sukhodoeva, 2011b). Resource flows between company departments and the resource market require robust regulation. Here the departure from the consumer demand becomes possible in the direction of novel resources, as high mental abilities of employees drive the creation of substitutes for conventional resources and become a powerful source for building and replenishing the company resource base. Administrative control is required both over development of and trade in resources. Therefore, not only the resource substitution plan, but also control over the quality of supplied resources become central to the regulation framework. The highly capable human resources in the field of resource management enable the implementation of digital business development programs. The companies get an opportunity to considerably shorten the time for business plans implementation due to the use of digital technologies.

Regulation of the resource base of a company should be based on the transformation of processes for coordination of all resources within the region at large and of their respective sources (Roganova et al., 2019). For example, companies from different industries operating in Nizhny Novgorod region have different sources of resources. Natural resources serve as raw materials for metallurgy, fuel sector, are used for production of construction materials and in agriculture. The key resource for machine building plants is iron ore, while the sewing enterprises need textiles. The range of the required resources is very broad and depends on the type of manufactured products. They are supplied domestically from Nizhny Novgorod region and from neighboring regions. In certain cases, enterprise location is based on strategically crucial considerations. Thus, the shipbuilding industry needs access to waterways, and defense enterprises are mainly located in large cities with the higher human capital.

The resource potential of the region should be embraced not only to ensure the supply to the companies of raw materials essential for their development, but also to prevent the deficit of resources of proper quality (Belyakova & Fokina, 2019). However, quality control is the company's own responsibility. The above considerations are critical not only for determining the structure and quantity of resources, but also for anticipating the future demand. Substitution of resources and introduction of substitutes

in the market are taken into account when creating digital programs for business development. The creation of high-quality resources should satisfy the goal of ensuring import substitution and spurring the development of domestic industries. In the elaboration of digital programs for business development the vital point is to improve access to the rare resources and the degree of their criticality.

2 Literature Review

The Strategy for Socio-Economic Development of Nizhny Novgorod Region till 2035 (2018) at the initial stage of its implementation falling on the years 2019-2020 envisages Transformation of the Region Management System as one of the three major priorities.

Regional differentiation by the level of development does not allow for standardization of the resource potential across territories. This is due to the heterogeneous resource potential across regions and the structure of the resources themselves. The use of digital technologies in manufacturing increases differentiation as concerns distribution of available resources. This has been raised by I. P. Dovbiy and O. A. Amirova (2013), who point out that in the digital economy, the resource management will be effective only subject to its proper realization. When technological paradigm changes, development in the regions undergoes transformations: from subsidized to coordinated.

The Decree of the President of the Russian Federation dated May 7, 2018 N 204 On National Goals and Strategic Objectives of the Russian Federation through to 2024 (2018) declares that the use of the benefits provided by the digital technologies for transformation of management processes will result in the use of high-quality resources. There are new powerful factors contributing to this process, which bring us closer to the desired outcomes. Thus, O. V. Gartovannaya (Gartovannaya & Dzhaginova, 2015) believes that nowadays the main focus of economists is on the effective supply of resources to enterprises and industries in general, as well as on the transformation of this process. In this paper, the authors describe a comprehensive resource management system for the companies.

According to the researchers, the main drivers of transformations in the resource management processes include:

- Increasing market competition in the field of resources;
- New weaknesses in the resources themselves;
- Capacity of regions to adjust to new resource markets (Sukhodoeva et al., 2015);
- Resource management in the regions with different development programs and mindsets of regional leaders;
- Tighter regulation over distribution of resources due to cutting down of government investments;
- Growing inequality of regions in their relationships with the country leaders;
- Global trends in the resources market have a positive impact on the resource trends in the regions;
- Concentration of resources in leading regions which have certain advantages as regards the resource potential (Sukhodoev et al., 2017).

The unique features of regions do not become clear immediately: enterprises of various modifications operate across industry sectors, but their homogeneity does not remain constant over time. This is attributable to the following reasons (Sukhodoev et al., 2017):

- There is no methodological framework for optimizing resource potential;
- The metrics of resource potential have not been identified yet;

- The region lacking administrative structure for growing resource potential and using the available resources;
- The lack of structure of resource potential critical for the development of each separate company and region as a whole.

Authors such as S. M. Nikonorov, S. V. Solovieva, K. S. Sitkina (2020), Zh. V. Smirnova, K. A. Kochnova (2020), A. V. Ponachugina, Yu. N. Lapygina (2019) in the age of digital economy believe that for sustainable development of regions not only resource management processes but also macroeconomic trends need transformation. The digital transformation is viewed as an essential condition for the development of the Volga macro region, and the existing economic models require updating. The experiment was carried out for balancing, on the one hand, the digital and economic factors for improving city management practices across Volga region, and on the other hand, the needs of individuals and legal entities. The referenced work presents the study of theoretical and methodological questions of transformation, as well as socio-economic foundation for achieving sustainable development across cities of the Volga region with reliance on digital technologies (Nikonorov et al., 2020).

Creation of new resources pursues the goals that are more technological: development of new types, exploring their unique properties and satisfying the market demand. In order to meet the development goals, the resource market should be extended and the consumer confidence in new resources should be built (Zhiltsova & Sukhodoeva, 2011a). The building of intellectual resource potential is a less difficult challenge due to its reproducibility. It includes a coherent system of relations for developing and creating innovative resources. The intellectual abilities of individuals allow to offer new developments to the companies that are ready to produce new nano-resources based on the improved substitutes. Consequently, the intellectual resource is used for revealing the relationship between the innovativeness and uniqueness of the sources replenishing the reserve fund in the resource market.

These sources may be domestic or external. Suppliers with large reserves are determined based on the input information. The technology for exploring the possible sources of reserves assumes probing of alternative mechanisms for creation of nano-resources: to produce or to purchase. The major applications of reserves are investigated concurrently with the market research, and signing of supply agreements is a final stage. Presently, there exist objective prerequisites for developing a new digital mechanism for effective management of the resource base in the region.

Based on the domestic and global experience, a new model should be created for managing the resource sources across different territories, allowing for the most efficient and long-term use of resource potential (Sukhodoeva & Coe, 2014).

For optimizing the use of various sources of resources, the companies need completely new organizational structures. The main contributors to such new structures include:

- Changes in the production and engineering facilities of the companies based on nano-technologies;
- Transformation of the structural policy for resource management on a scale of the company and the region as a whole;
- Most beneficial conditions for using domestic sources of resources;
- Changes in the potential resource requirements due to the targeted programs for development of the regions;
- Matching potential resource requirements with actual capacity to source needed resources;
- Shift in actual resource requirements towards replacement with analogs and substitutes.

In addition, it should be noted that along with appearance of substituted sources of nano-resources, changes also occur in the digital agenda of the companies.

3 Research Methodological Framework

The research purpose was to identify the trajectories for transformation of resource management processes based on the digital technologies.

The research objectives were as follows:

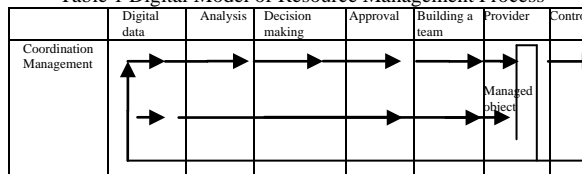
1. Develop a resource management system having in its structure both the company resources and resources of the digital environment.
2. Identify the reasons for using new digital technologies in the manufacturing system attributable to the rising differentiation in resource base distribution.

The methodological framework of research was constituted by the general research methods, such as analytical, sociological methods, methods of experiment, logical and statistical analysis, systemic and imitation modelling.

4 Results and Discussion

A digital model of resource management has been proposed which allows not only top-down but also bottom-up delegation of powers. Therefore, there is a need in a new approach to building and regulating the resource potential of companies, cities and regions. Consequently, the digital mechanism for creating the reserve fund of resources becomes unbiased, transparent and relevant to the needs of modernity for its reformation and transformation (Table 1).

Table 1 Digital Model of Resource Management Process



Source: compiled by the authors

The resource transformation of the management process may be defined as a socio-economic mechanism of management, which is a complex combination of connections and relations with regard to distribution of the resource sources and building of the resource potential. This mechanism involves different subjects and requires new organizational forms of their interaction, as well as properly organized production processes driven by the digital technologies.

This model facilitates informed decision making at all levels of management based on the available reserves and allows the use of most advanced consumption methods (High Openness of China as a Guarantee of Progressively Improving Living Standards, 2018). The top-level leaders assess the possible drivers of resource potential with the lowest cost of reproduction, for ensuring the sufficient quantity, proper quality and best price of unique resources. A forecast of resource potential and trajectories of its development is made. Further, the resource market is regulated by introducing a mechanism of substitution with analogues. Alternative sources are identified and a hierarchy of strategic partners is drawn up. The informational low-level leadership performs modelling of actual resource demand across administrative agencies and particular companies. Resource supply options are assessed: internal production or outsourcing. Development and implementation of any digital technology is subject to the human resources possessing required expertise and the financial capacity (Sukhodoeva et al., 2015).

The development of a new mechanism for transformation of resource sources management is based on the theory of interregional differentiation, which makes it possible to justify authority at the regional level in the distribution of resources, to reveal contradictions between different levels, to justify their distribution not only among regions but also among the companies (Sukhodoev, 2016). The effectiveness of new digital

technologies becomes evident in the long-term planning. This is manifested in the interrelation between sources at all territorial levels, which is contingent on a single methodological mechanism for resource distribution. It should prescribe methods and modes of action for distribution bodies and define their interactions in relation to resource distribution.

Resource management starts with the study of a special range of digital technology tools necessary for development of any and all companies within a particular territory (on a scale of region). The digital tools need optimization in the part of identification of negative implications of their use. The monitoring is based on standard indicators of statistical accounting for resource potential metrics. The resource potential of an enterprise may be strengthened by decreasing resource costs, reducing resource intensity and saving secondary raw materials.

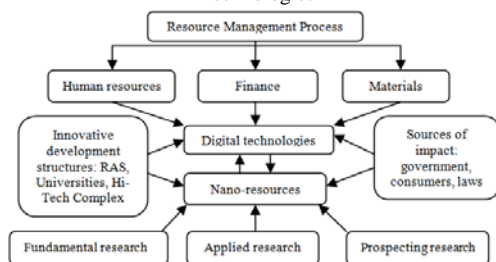
The intellectual potential of human resources may result in the new ideas of substitutes for conventional resources and become an impetus for growing the resource potential of companies at large (Roganova et al., 2018). Administrative control is required both over development of and trade in resources. Therefore, not only the resource substitution plan but also the control over supply become central to the regulation of resource flows and application. The resource management based on the digital technologies make it possible to implement innovative programs in digital economy. The companies get an opportunity to considerably shorten the timeframes.

The use of digital model for resource management is the key to implementation of national programs. S. V. Orekhova (2017, p. 3) notes in her research that in the modern context of resource scarcity in the Russian economy, it is crucial to identify priorities and major factors that have impact on the companies. Transformation of resource management processes in the companies becomes the main focus in elaborating the mechanisms for sustainable development of the companies. This study helped to systematize different approaches to interpreting the nature of resources. The substantive exploration by the authors of the current resource problem resulted in their proposal of a resource management system which structure encompasses both enterprise resources and digital network resources.

Within the framework of the national project "Digital Economy" some developed megacities already have certain components of the reviewed system, such as information infrastructure, digital public administration. Continuing this research topic, O. O. Smirnova concludes that "as a rule, the regional level is underrepresented in the current industry programs. These documents lacking specific proposals for territorial development complicates the development of good synchronized plans and strategies for socio-economic development of the Russian regions" (Roganova et al., 2018, p. 108).

Transformation of processes aimed at the supply of new resources assumes creation of new nano-resources and the use of certain digital solutions (Digital Economics: Trends and Prospects of Business Transformation, 2019). Resource flows between company departments and the resource market require robust regulation (Figure 1). Here the departure from the consumer demand becomes possible in the direction of novel resources.

Figure 1 Mechanism of Resource Management Digital Technologies



Source: compiled by the authors

Coordination of the resource base of a company should be based on the interplay between all resources within the region at large and their respective sources (Belyakova & Fokina, 2019). The resource potential of the region should be embraced not only to ensure the supply to the companies of raw materials essential for their development, but also to prevent the deficit of resources of proper quality. However, quality control is the company's own responsibility. The above considerations are critical not only for determining the structure and quantity of resources, but also for anticipating the future demand. Substitution of resources and introduction of substitutes in the market are taken into account when creating business development programs.

The substitution of resources should satisfy the goal of ensuring import phase-out and spurring the development of domestic industries (Zhiltsova & Sukhodoeva, 2011a). In the elaboration of business development programs the vital point is to identify how accessible the rare resources are and the degree of their criticality. Regional differentiation by the level of development does not allow for standardization of the resource potential across territories. This is due to the ununiform resource potential across regions and the structure of the resources themselves. The use of new digital technologies in manufacturing increases differentiation as concerns distribution of available resources. The new powerful factors include:

- Increasing market competition in the field of resources;
- New weaknesses in the resources themselves;
- Transformed capacity of regions to adjust to new resource markets;
- Resource management in the regions with different development programs and mindsets of regional leaders;
- Tighter regulation over distribution of resources due to cutting down of government investments;
- Growing inequality of regions in their relationships with the country leaders;
- Global trends in the resources market have a positive impact on the resource trends in the regions;
- Concentration of resources in leading regions which have certain advantages as regards the resource potential.

The unique features of companies become evident over a certain time span: in addition to changes in the corporate organizational structures, the goals are set for implementing development programs within various territorial entities. The creation of a new model range of businesses is not an ongoing process, which results in the diversity of decisions made even within one industry sector. This is attributable to the following reasons:

- There is no methodological framework for optimizing resource potential;
- The metrics of resource potential have not been identified yet;
- There is no administrative structure for growing resource potential and using the available resources;
- The lack of structure of resource potential critical for the development of each separate company and region as a whole.

The use of digital tools depends on the particular field of their deployment. As practice shows, mainly two types are used based on the information distribution space: online or offline space. For attracting potential clients, the necessity arises to create a specific range of management methods and tools powered by digital technologies for each type of information space.

5 Conclusion

Transformation of resource distribution processes requires the use of a range of digital technologies. Coordination of resource potential of the companies based on the digital technologies may be carried out via multiple channels. The main challenge for the companies is to find appropriate channels for reliable two-way communication and the most optimal sourcing system.

1. In practice, digital technologies are often used to access different communication channels in order to search for

- resources. Digital technology includes the tools for consumer communication with resource providers through special digital channels such as: smartphones, computers, tablets, TV, radio, digital screens.
2. The digital technology may also be implemented in offline channels in the form of the links to electronic resources and QR codes. The digital resource technologies imply a personalized approach. It becomes crucial to know the needs, preferences and interests of potential clients in the new types of resources.
 3. Today the most extensively used is the targeting technology, which messages reach many clients and which remains the main means of interaction for them. The audience of this channel is the largest and its costs are minimal. Targeting allows to bring additional potential consumers and to maximize the profit from the creation and sale of nano-resources. The symbiosis between content and digital solutions in such operations proves to be the most efficient; it is also recommendable to assess the quality of this interaction.
 4. The creation of a digital system for resource management implies the use of mutually complimentary online and email tools for resource studies. Only on that basis it is possible to roll out a client-oriented initiative for promotion of new resources.
 5. The system for transformation of resource management processes with the help of digital technologies becomes the scaffolding for the concept of resource creation and distribution. It is based on the assumption of optimal environment for the activities of municipal and other administrative bodies in cooperation with business entities operating in the region. The digital model of the economy is destined to ensure the development of high-tech production companies by embracing the qualitative resource potential of each single enterprise.
 6. The digital mechanism for managing the resource sources has largely resulted from the increasing competitiveness among the resources themselves and the investments in the quality of products. Improved manageability on a regional scale and at the company's level results in higher budget funds and coordinated distribution of resources within the territory.
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