

State Information System of Housing and Utilities Sector as a Basis of Network Relationship Management in Russia



Dmitri Pletnev, Olga Fink, and Oleg Dyachenko

Abstract The aim of the chapter is to analyze the current situation with implementation of the state information system of the housing and utilities sector and the prospects of its development in Russia. The authors analyze the impact of state and state participation in the development of network relations. The advantages of the State Information System of Housing and Communal Services (GIS ZhKH) for the participants of the system are analyzed. Actual problems and disadvantages of institutional environment of GIS ZhKH are described. The relationships between actors of GIS ZhKH are summarized; importance on network relationships for the further development of the industry is substantiated. The authors also discuss the role of the state in the network relationship of participants in the GIS ZhKH.

Keywords Network relationship · Network relationship management (NRM) · Housing and utilities sector · Institutional environment · Russian economy

1 Introduction

In the 2010s, thanks to the development of the digital economy and the improvement of information technology, the need to use information in society has increased, as well as its processing in various information systems to optimize management processes in any area. E-government and digital economy are identified as priorities of the Russian development strategy for the period up to 2035. During this period, the program of development of the digital economy and information society will be implemented. First, it involves the use of electronic document management systems and methods of teaching the heads of public administration the e-government technologies.

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The concept of e-government is being implemented in many countries. Therefore, the mechanism of building information relations between the state and society (Bejtlich 2013) is becoming more relevant today. These relations are formed with the help of a variety of information systems, which through ordering social relations are implemented in all spheres of society, even in the housing and utilities sector. It is the housing and utilities sector that plays a significant role in shaping the socioeconomic life of the Russian Federation. In many spheres of public life, modern technologies help to increase the efficiency of interaction between the subjects. Thanks to the achievements of the Industry 4.0, it is possible to record accurately and manage processes in various spheres, including housing and utilities sector.

In order to strengthen control and improve the efficiency of the housing and utilities sector, the introduction of a single payment document or a single receipt and single cash settlement centers was recently considered so that all citizens of the country would receive only one receipt that would indicate all utilities and the amount of payment for them for the past period. This, in turn, will contribute to the reduction of arrearage in payment for utility bills, control of tariffs by the state, convenience of noncash payment, and improvement of service and information transparency. However, the proposal to create a single receipt was not supported by the utilities companies and fully implemented. Nevertheless, the idea of a single receipt was embodied in the form of an electronic single receipt, which can be obtained with the help of a special service—State Information System of the Housing and Utilities Sector (GIS ZhKH). In 2014, on the basis of instructions from the President the Federal Law (2014) was adopted. The law regulates the relations arising in the creation, operation, and modernization of the GIS ZhKH. As a result, a single federal centralized information system has emerged that functions on the basis of software tools and information technologies on the housing stock. The Russian state is oriented toward the modernization of the economy and relations in the housing and utilities sector, which involves new models of interaction between the economic subjects, which requires the development of the concept of creating this model. Total information of all economic processes, without a complete understanding of all subjects, their interests, benefits, and costs, will not bring the results that the state expects to stimulate this activity. This article examines the advantages and disadvantages of the emerging network relationships between firms in the housing and utilities sector based on the GIS ZhKH. The basis of these relations is an effective mechanism of network relations between the state, utilities companies, and the households. The article also discusses the main participants in the processes included in the GIS ZhKH. Today there are not enough works devoted to conceptualization and a systematic view of the ongoing transformations in the information sphere of the Russian economy, and the presented study serves precisely this purpose.

2 Literature Review

The problem of network relations involving the state is in the focus of researches. Policy-makers pay attention to the problem of developing the digital society, using strategies and programs for the development of the digital economy in the States (see Table 1).

In Russia, the Message of the President of the Russian Federation to the Federal Assembly on December 01, 2016 can be considered as the starting point for the development of the digital economy. The intensive development of the digital economy in the world leads to the transformation of economic sectors, as information technologies change business processes, improving efficiency by enlarging the number of the participants. The enlargement of the number of Internet users by 10% will increase GDP growth from 0.4% to 1.9% (Milgrom and Roberts 1990). The development of technological progress is now becoming one of the main policy priorities of the countries, leading corporations, and research centers. In recent years, the digital initiative of the information system development has attracted the attention of the state and firms. In 2011 the exhibition in Hanover presented the results of the development of new principles for the development of German industry based on new technologies and business models (Wahlster and Müller 2013), which are reflected in the development strategy of Germany. Similar developments are presented in other leading countries:

- Strategic plan for the development of industry until 2050 in the UK (UK Government 2018).
- NNMI (2018) for the development of the American network of cooperation between science, industry, and government in the USA (Industrial Internet Consortium).
- French industrial development plan Amcham France (2013), aimed at supporting industrial projects.
- The concept of “robot revolution” in Japan (Tanaka 2017) based on the Internet of Things.

Table 1 Years of adoption of digital economy development programs at the state level in different countries

Year	Country
2000	Denmark
2005	Singapore
2006	Australia
2008	Hong Kong, Great Britain, New Zealand
2009	The European Union
2010	Canada
2012	Malaysia
2013	South Korea
2015	India, Kazakhstan, New Zealand
2016	Russia

Source: Pukha (2018)

- The program “Made in China 2025,” published by the China’s State Council in 2015, which involves the integration of information and communication technologies and industrialization (Lee 2015).

Horák (2016) also confirms that building a digital information system of production leads to a synergetic effect due to productivity growth, increased marketing efficiency, and profit growth allows to increase investment. Roblek et al. (2016) agree that Industry 4.0 can be considered as an objective trend of the development of the main industries and the world economy, as well as management in industrial organizations.

In the digital economy, information becomes a form of capital. Its formation, accumulation, and use require close interaction of the state, business, and society. However, economic advantages are obtained by those states and economic entities that have not only access to information but also to effective technologies for its processing. The qualitative growth of the economy is possible with the availability of technologies that make it possible to estimate the current state of markets and branches as accurately as possible, and also effectively forecast their development and react quickly to changes in the national and world market conditions (see Kuprijanovskij et al. 2016). Russia’s digital economy is far from the world’s leaders in terms of the development level, its share in GDP is 2.1%, Russia is 39th in the world out of 85 (according to WorldBank 2016). The backwardness of Russia from the leaders of the rating is 5–8 years. In terms of infrastructure development level, Russia is the leader among the BRICS countries; however, it is 1.5 times behind the OECD (Organization for Economic Cooperation and Development) average.

For comparison there will be taken some examples of similar foreign experience. According to the data presented in Makovich (2010), the most popular are e-government websites in Sweden, Norway, Singapore and Denmark, England and Japan in this regard have the lowest rates (see Fig. 1). Thus, Russia has announced the rapid development of complex electronic technologies and is actively promoting relevant projects, forcing the regions to meet the stated requirements at the legislative level.

One of the aspects of digitalization is the possibility of building new network relations between the majority of the actors. Snow et al. (1992) proposed a conceptual framework for the study of network relations in the interorganizational interactions. There are a number of works developing this research line today. The importance of using network relationships in systems client relationship management (CRM) is detailed in works by Ritter et al. (2004), Ritter and Gemünden (2003a, b, 2004), and Achim et al. (2006). The need to implement network law in connection with the increasing role of virtual space is justified in Grishina (2017). The purpose of network law is to find methods of legal regulation in the cyberspace of social relations. It should be noted that in the conditions of modern world globalization the legal regulation of network legal relations, rapidly developing under the influence of digitalization, is a factor of stability and the key to the positive dynamics of national statehood. In Castells (1997) is showed the constructive changes associated with the transition to the information society, in which the

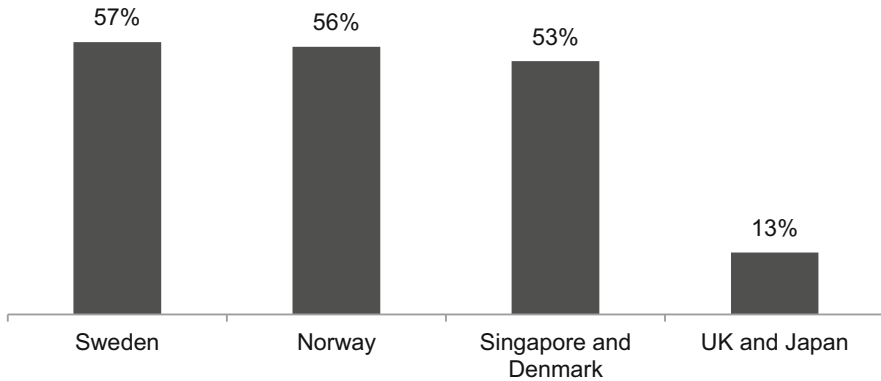


Fig. 1 Popularity of e-government website in some countries. Source: Compiled by authors based on data Makovich (2010)

creation, collection, processing, and transmission of information are the main sources of efficiency of power and network relations. E-Commerce is widely used today. In the rapid development of the computer industry in the world, the rapid growth of information resources creates the necessary material and technological basis for the development of e-Commerce and electronic payments in Russia.

The relevance and necessity of introduction of the GIS ZhKH is caused by the growth of computerization of the households. Such a goal as creating additional competence and education of people is also not ruled out. The basis of network interactions will be based on the communication of utilities organizations and the households, which are already users of Internet systems. In turn, for the state there is additional control over the financial flows of utilities companies, tax deductions, obtaining reliable information on the implementation of state housing programs, and targeted spending of budget funds. In addition, the GIS ZhKH will reduce the number of requests by authorities to the legal entities, ensure the greatest accuracy of statistical information, that is, ultimately make the housing and utilities business the most transparent and open. According to the plan of the legislator, all information about the house, located in the GIS ZhKH, will create a so-called home passport. The above-mentioned advantages of network relations in the GIS ZhKH will significantly reduce transaction costs, increase information transparency, and trust.

In order to increase competition, it is necessary to develop an equal dialog between public organizations, businesses, and the state on key issues and respect the principle of openness and accessibility of information about decisions aimed at maintaining competition for all participants. Uvarov and Uvarova (2017) believe that the GIS ZhKH will contribute to the successful modernization of the economy and social sphere, building effective mechanisms for interaction between society, business, and the state, aimed at coordinating efforts of all parties and sustainable improvement of the welfare of the Russian citizens. However, it should be noted that in addition to attracting the organizations of the GIS ZhKH into this information

system, it is necessary to activate the attraction of ordinary people in whose interests it should function.

3 Data and Methodology

The study of the implementation process and prospects for the development of the GIS ZhKH was carried out on the basis of the analysis of the current regulatory framework of the Russian Federation, including the Gosudarstvennaya Duma of the Russian Federation (1996, 2004, 2014), Ministry of Communications of Russia & Ministry of Construction of Russia (2016). Information on the results of the application of the GIS ZhKH program for the constituent entities of the Russian Federation, as well as the main actors of this program, was obtained from GIS ZhKH (2018).

4 Results

The GIS ZhKH became the single portal in housing and utilities sector of Russia. The state created forcibly a network structure, which unites more than two million legal and physical entities. The GIS ZhKH System combines all companies operating in this sphere: resource providers, overhaul operators, management companies, state supervisory authorities, and resource consumers (firms and households). The authority to obtain and enter information into the system is determined for all users of the GIS ZhKH. The center of this network structure is the state itself. It also has the rights to determine membership in the whole structure. All participants of the network will be able or even obliged to communicate with each other; it especially concerns the interaction “citizen—utilities organization.” The basis of these network relations—information, the ability to get it anywhere and at any time. The positive impact on business results for the companies involved is enormous. At the same time, such a model of network relations can bring threats to business security, which must be eliminated in all possible ways.

The efficiency of network relations now is low. It is evidenced by the existing problems of the GIS ZhKH. First, the actual percentage of the households that has direct access to the Internet and can be a permanent and systematic user of the GIS ZhKH is unknown. All telecom operators in the country—MTS, Vimpelcom, Megafon, Rostelecom (“the Big Four”)—should take care of this. That is, a circle of persons dependent on the GIS ZhKh is not fully defined and has the potential for expansion. Second, in order to ensure the conditions for the content of reliable information in the GIS ZhKH, the system guarantees the topicality of information on the first day of each month. It is only possible to find out the real state of the personal account of the utilities service from the utilities company. This fact sharply reduces the popularity of the GIS ZhKH, except for the responsible part

of the households, which fulfills payment obligations in accordance with the contracts. The numbers of the GIS ZhKH will be clear and comfortable for these people. Third, it is not known how quickly the system will work in full functionality, which was conceived at its creation. Most utilities organizations note the difficulty of working with this software package, which is associated with the labor intensity of entering housing stock, as well as further automating the operation of the system.

Kolokolova (2018) believe that the GIS ZhKH can do more harm than good. For example, in the case of an unformed electronic payment document for the housing and utilities services or the invalid data in it on paper, a citizen may not pay for services. This, in turn, will entail arrears and legal proceedings. Failure of the management company to provide information may lead to a number of negative consequences for it, since the requirement to place information in the GIS ZhKH is licensed. All this will take place against the backdrop of system failures.

The GIS ZhKH is complex. Its functioning causes the relationships not only between authorities, firms, and households, but also the relationship of the households among themselves. Naturally, peoples are not quite ready to work in the system. Taking any legal decisions (for example, the decision of the meeting of homeowners) is problematic because of insufficient qualification in this sphere. There are also problems with the authorities—it will be problematic to find documentation for old apartment buildings and facilities (pumping stations, boiler rooms, etc.), which is necessary, but difficult to restore and digitize. Housing and utilities organizations have responsibilities to place all the information that must necessarily be complete, reliable, and timely brought to the citizens. Failure to perform these duties entails large penalties.

In order to ensure the participants' interest in work of the GIS ZhKH it is necessary, to create conditions for cost-neutral treatment in the system, to define the duties and rights of all participants of the system as precisely and fully as possible. The system should be convenient, accessible, and understandable to a simple citizen. The state and companies have the necessary financial and human resources to improve work in the GIS ZhKH. One of the benefits of the GIS ZhKH for all participants is the fact that the information it contains is recognized as the most truthful and priority, rather than on any other medium.

Statistics on the implementation of the GIS ZhKh on August 5, 2018 is as follows. In total, the system registered 90.7 thousand organizations, 1.5 million apartment buildings, and 18 million houses. At the same time, the lowest degree of the loaded information about dwellings is in cities of federal significance. The obligation to place information in the GIS ZhKH is from July 1, 2019, and amounts on average to 77.9%, while in other regions of the country it amounts to 98.9%. This suggests that in cities of federal importance it is much more difficult to collect and accumulate the information.

The GIS ZhKH unites all the companies operating in this sphere: resource supply organizations, overhaul operators, management companies, state authorities (federal,

regional and municipal), and direct consumers of resources (firms and households). All users of the GIS ZhKH system can be divided into five categories: system operator, services consumers, services suppliers, state authorities, and other organizations.

The service operator performs the functions of administering the system and the website of the GIS ZhKH (creation, operation, and modernization of the system). The services users are primarily individuals using information placed in the system. In addition, legal entities and even state authorities use the information. Placement of information in the system is carried out by the state authorities (information about the housing stock—addresses, streets, and houses), legal entities, individual entrepreneurs, regional overhaul operator, regional operator for the management of solid municipal waste, resource supply organizations, management organizations, property owners association, housing complex, and housing-construction cooperative. The main work is done by the resource supply organizations and management companies that provide the population with basic public services: hot water supply, cold water supply, water disposal, electricity, gas, heating, and other utilities (television, Internet, and maintenance of the pre-home territory). State authorities are obliged to post information on the authorities authorized to post information in the system of officials of public authorities. Other companies obliged to post the information are also involved in the exchange of information. These are banks, unified settlement and cash centers, payment agents, and the Post of Russia.

In the future, it is possible to add new participants of the information interaction, which perform not only the key functions in the interaction of the main participants but also intermediary, additional functions, including (see Fig. 2):

- Supervisory authorities—the prosecution office and the police, to speed up the resolution of disputes arising between the parties of the interaction.
- Licensing authorities.
- Sellers of the equipment necessary for the utilities sector (meters, sensors, gas stoves, boilers for heating, etc.).
- Real estate organizations for advertising new housing.
- Various investors to improve the problematic situations arising among the resource providers.
- The organizations of environmental protection.

5 Conclusions

Digitalization of the economy can improve life quality, make it more comfortable. However, there are certain disadvantages associated with the protection of information, because the digital economy involves the storage of data in electronic form. It is necessary to develop not only the technologies themselves, but also the ways to protect data from various hacking and cyberattacks. Any information interaction faces additional problems: the constant growth of information volumes and the

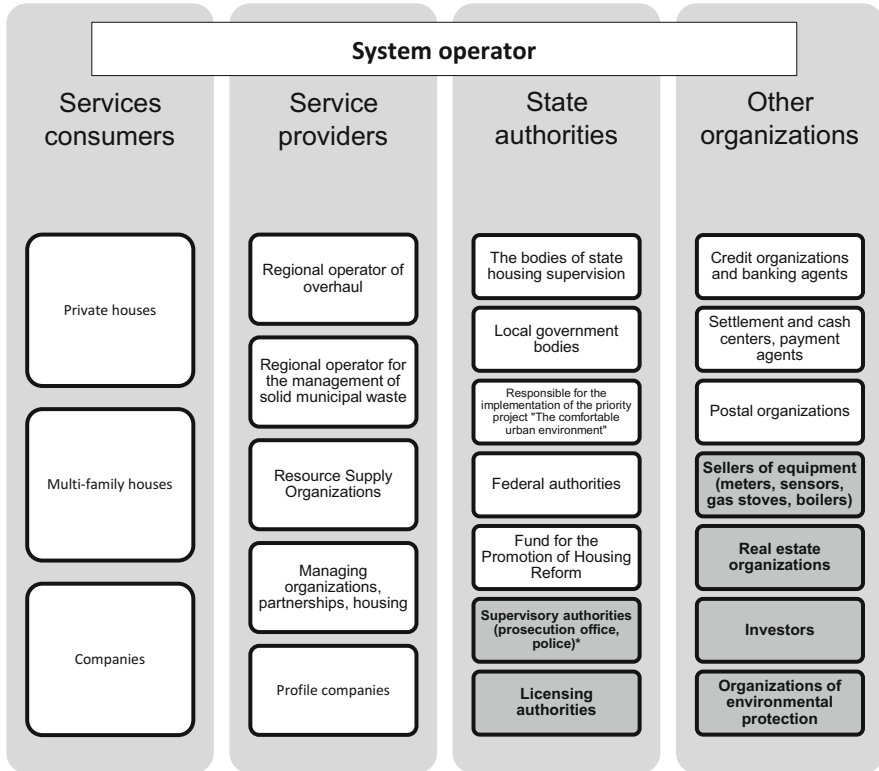


Fig. 2 Current and prospect stakeholders GIS ZhKH. Source: Compiled by the authors. *Note: Asterisk in artwork indicates that prospect stakeholders are in bold and gray*

spontaneity of their appearance, the need for reliability criteria for information, the availability of information search and filtering, information security, the dissemination of incorrect information, the need for authorship, the fact of unloading information and its date, and the source of information.

The social development of society increasingly predetermines the interaction of the state and society in the form of developing and introducing new ideas. In this regard, the importance of network relations in ZhKH is increasing. It will be carried out through mediation and information exchange via the Internet. Internet and the digital economy are an opportunity for dialog and cooperation without any barriers, a platform within which we create something new. Strengthening of the network relations through the use of the achievements of the digital economy contributes to the growth of the efficiency of the interaction of the subjects in the housing and utilities sector raises the trust level between them, creates information transparency. Accordingly, in the absence of intermediaries in the information exchange, it reduces transaction costs, improves service in servicing consumers, and develops the economy of the country and contributes to its sustainability. Also, among the univocal trends is an inexorable movement toward the formation of the digital economy and

the need to forecast further development with the aim of adapting and enhancing the sustainability of all elements of the infrastructure, financial support, state management, and primarily innovative sphere.

References

- Achim, W., Auer, M., & Ritter, T. (2006). The impact of network capabilities and entrepreneurial orientation on university spinoff performance. *Journal of Business Venturing*, 21(4), 541–567.
- Amcham France. (2013). *34 Sector-based initiatives for a French industrial renaissance* [online]. Accessed 01.08.2018, from <http://www.amchamfrance.org/>
- Bejtlich, R. (2013). *The practice of network security monitoring: Understanding incident detection and response*. San Francisco: No Starch Press.
- Castells, M. (1997). An introduction to the information age. *City*, 2(7), 6–16.
- GIS ZhKH. (2018). *Gosudarstvennaya informatsionnaya sistema zhilishchno-kommunal'nogo khozyaystva* [State Information System of Housing and Utilities Sector] [online]. Accessed December 19, 2018, from <https://dom.gosuslugi.ru/#!/main>
- Gosudarstvennaya Duma of the Russian Federation. (1996). *Grazhdanski Kodeks Rossiyskoy Federatsii (chast' pervaya)* [Civil Code of the Russian Federation (Part One)], 30.11.1994.
- Gosudarstvennaya Duma of the Russian Federation. (2004). *Zhilishchnyy kodeks Rossiyskoy Federatsii* [Housing Code of the Russian Federation], 29.12.2004
- Gosudarstvennaya Duma of the Russian Federation. (2014). *Federal'nyy Zakon "O Gosudarstvennoy Informatsionnoy Sisteme Zhilishchno-Kommunal'nogo Khozyaystva"*. [The federal law "On the state information system of housing and communal services"], FZ 2014/209, 23.07.2014
- Grishina, T. M. (2017). Cetevomu Obshchestvu – Setevoye Pravo. [Network Society – Network Law]. *Vestnik mezhdunarodnogo yuridicheskogo Instituta*, 2(61), 5–16.
- Horák, J. (2016). Does industry 4.0 influence efficiency of financial management of a company? In Tomáš Löster, Tomáš Pavelka, & Libuše Macáková (Eds.), *The 10th International Days of Statistics and Economics Conference Proceedings* (September 8–10, 2016, Prague, Czech Republic) (pp. 574–582). Prague: Melandrium.
- Kokololova, E. O. (2018). Gosudarstvennaya informatsionnaya sistema kak sredstvo monitoringa i povysheniya effektivnosti deyatelnosti zhilishchno-kommunal'nogo khozyaystva: Pravovoy aspekt. [State information system as a means of monitoring and improving the efficiency of housing and communal services: the legal aspect]. *Vestnik rossiyского universiteta kooperatsii*, 1(31), 124–127.
- Kuprijanovskij, V. P., Namiot, D. E., & Sinjagov, S. A. (2016). Cyber-physical systems as a base for digital economy. *International Journal of Open Information Technologies*, 4(2), 18–25.
- Lee, X. E. (2015). Made in China 2025: A new era for Chinese manufacturing [online]. *CKGSB Knowledge*. Accessed 01.08.2018, from <http://knowledge.cgsb.edu.cn/2015/09/02/technology/made-in-china-2025-a-new-era-for-chinese-manufacturing/>
- Makovich, G. V. (2010). *Menedzhment Znaniy: Dokumentatsionnoye Obespecheniye Upravleniya* [Knowledge Management: Documentation Management Provision]. Moscow: Akademia Estestvoznaniya, n.p.
- Milgrom, P., & Roberts, J. (1990). The economics of modern manufacturing: Technology, strategy and organization. *American Economic Review*, 80(3), 511–528.
- Ministry of Communications of Russia & Ministry of Construction of Russia. (2016). *Ob utverzhdenii sostava, poryadka, srokov i periodichnosti razmeshcheniya v gosudarstvennoy informatsionnoy sisteme zhilishchno-kommunal'nogo khozyaystva informatsii o predstavlenii sub'yektam Rossiyskoy Federatsii i munitsipal'nym obrazovaniyam finansovoy podderzhki na provedeniye kapital'nogo remonta mnogokvartirnykh domov, pereseleniye grazhdan iz*

- avariynogo zhilishchnogo fonda, modernizatsiyu sistem kommunal'noy infrastruktury, a takzhe o vypolnenii usloviy predostavleniya takoy finansovoy podderzhki. [On the approval of the composition, procedure, timing and periodicity of placement in the state information system of housing and communal services information on providing financial support to constituent entities of the Russian Federation and municipalities for capital repairs of apartment buildings, resettlement of citizens from emergency housing stock, modernization of communal infrastructure systems, and also on the fulfillment of conditions for the provision of such financial support], Order of the Ministry of Communications of Russia No. 77, Order of Ministry of Construction of Russia No. 120, 02.03.2016*
- NNMI. (2018). *National network for manufacturing innovation* [online]. Accessed 24.07.2018, from <https://www.manufactur-ing.gov/programs/glossary/national-network-manufacturing-innovation>
- Pukha, Y. U. (2018). «Industriya 4.0»: Sozdaniye Tsifrovogo Predpriyatiya. Vsemirnyy Obzor Realizatsii Kontseptsii «Industriya 4.0» za 2016 god. [“Industry 4.0”: The creation of a digital enterprise. World review of the implementation of the concept of “Industry 4.0” for 2016] [online]. Accessed 01.08.2018, from http://www.pwc.ru/ru/technology/assets/global_industry-2016_rus.pdf
- Ritter, T., & Gemünden, H. G. (2003a). Network competence: Its impact on innovation success and its antecedents. *Journal of Business Research*, 56, 745–755.
- Ritter, T., & Gemünden, H.-G. (2003b). Inter-organizational relationships and networks: An overview. *Journal of Business Research*, 56(9), 691–697.
- Ritter, T., & Gemünden, H.-G. (2004). The impact of a company’s business strategy on its technological competence, network competence and innovation success. *Journal of Business Research*, 57(5), 548–558.
- Ritter, T., Wilkinson, I. F., & Johnston, W. J. (2004). Managing in complex business networks. *Industrial Marketing Management*, 33, 175–183.
- Roblek, V., Meško, M., & Krapež, A. (2016). A complex view of industry 4.0. *SAGE Open*, 6(2), 1–11.
- Snow, C. C., Miles, R. E., & Coleman, H. J., Jr. (1992). Managing 21st century network organizations. *Organizational Dynamics*, 20(3), 5–19.
- Tanaka, H. (2017). Where has the Japanese core of “Monodzukuri” come from, and where is it going? *Romanian Economic Business Review*, 12(2), 57–71.
- UK Government. (2018). *Collection: Future of manufacturing*. Foresight project looking at the long-term picture for the UK manufacturing sector between now and 2050 [online]. Accessed 04.08.2018, from <https://www.gov.uk/government/collections/future-of-manufacturing>
- Uvarov, A. A., & Uvarova, Y. S. (2017). GIS ZHKKH kak gosudarstvennyy regulyator konkurentnoy politiki v oblasti kommunal'nogo khozyaystva. [ES GIS Housing as a state regulator of competition policy in the field of municipal services.]. *Innovatsionnaya ekonomika i pravo*, 4(9), 35–38.
- Wahlster, W., & Müller, C. (2013). Multimodale Dialogsysteme für Interaktive Anwendungen im Fahrzeug. *Automatisierungstechnik*, 61(11), 777–783.
- WorldBank. (2016). *World development report 2016: Digital dividends* [online]. Accessed 01.08.2018, from <https://openknowledge.worldbank.org/bitstream/handle/10986/23347/9781464806711.pdf>