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Technology Transfer in Digital Era: Legal Environment

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Abstract

The spread of disruptive technology in the digital era is the ruling condition of modern sustainable development. The authors proceed from the fact that legal tools for the creation and use, protection of advanced technologies provide the technology transfer process from the owner to interested parties for further practical, commercial application or further improvement. The article analyzes the legal positions of the concept of technology, legal ways to use modern technologies, stages of their implementation and practical application. In the innovation process legal mechanism in combination with the modern means of innovative development stimulates the creation and transfer of new technologies and at the same time it is a key factor for sustainable development in the context of modern digital technology revolution. In the modern digital revolution, the technology transfer acquires new features and ways for the dissemination of technical innovation, which creates new challenges for legal theory and practice, and legal tools should meet the challenges of the time.

Keywords: Intellectual property rights, Innovation, Intellectual property transfer, Means of technology transfer, Digital revolution.

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1. Introduction

Coming era of digital technology is related to creation and acquisition of disruptive technologies, formation of sustainable development directions. Recently technical innovations, creation and widespread use of modern digital technologies have generated a process of revolutionary change in society - the so-called "digital revolution" that is consistently shaping new social, economic, political and legal reality. The research of mechanisms of creation and application of modern technologies is targeted at the increase of regulation efficiency in the innovation area, including legal and economic aspects of legal relations of intellectual property.

The latest technical achievements, as mentioned by the WIPO (World Intellectual Property Organization) in recent documents (WIPO, Licensing and Technology Transfer, 2017), stimulate further progress in science and technology and at the same time eliminate traditional borders between spheres of technology, as well as contribute to the mutual penetration of technology into new more complex areas of technology.

Innovative development is transformed into a new digital reality and is manifested in the widespread use of high-speed Internet and Internet of Things, modern robotics and artificial intelligence (robotics & AI), Big data and Analytics, Cloud computing, system integration, numerical modeling (simulation), augmented reality, additive manufacturing and cyber security systems (BCG Focus, 2015).

In this regard, occurrence and formation of the so-called new European Industrial Renaissance (EU, 22.1.2014 COM, 2014) as a strategic direction in new "reindustrialization" (European Competitiveness Report, 2013), the provisions of which are defined in new European industrial and innovation strategy "Horizon 2020 Program", are beyond question. The crisis of recent years has emphasized the importance of the real sector of the economy and strong industry.

In the updated "Industrial Renaissance" strategy a significant place is given to the state stimulation of innovative developments, stimulation of investments into areas of innovation production, broadening of the R&D spectrum, formation of production chains for creation of innovation products and technologies based on industry, inter-industry, international production cooperation and interaction of enterprises of different forms of ownership, including state-private partnership.

So, in Russia, the "Strategy of scientific and technological development of the Russian Federation" was approved in 2016.⁴ In Germany, the "INDUSTRIE 4.0" platform (program) for 2013–2025 is successfully implemented. Similar programs are in place in other European countries: "Smart Factory" (the Netherlands), "Usine du Futur" (France), "High-Value Manufacturing Catapult" (UK), "Fabbrica del Futuro" (Spain), and "Made Different" (Belgium). In China, there is the "Made in China-2025" national program. In the USA, in 2014 the General Electric, AT&T, Cisco, IBM, and Intel companies have created the Industrial Internet Consortium that ultimately united over 170 US companies. The Digital Strategy as part of a new UK industrial strategy (Tech Nation 2016) was launched in January 2017 aimed at the innovation inducement to a long-term period of post-Brexit era and strengthening the UK technological leadership. At the same time, the Republic of Belarus adopted the State Program for the development of the digital economy and information society for 2016–2020 in 2016.

The modern innovation development assumes active dissemination and transfer of technical innovations and new technologies for their further practical application or improvements. The potential of the technical innovations is realized through the mechanisms of taking advantage of implementing the new technologies from the standpoint of assurance of stable economic growth, forming of fair competition,

⁴ Strategy of scientific and technological development of the Russian Federation (approved by Order of RF President No. 642 dated December 1, 2016) <http://www.pravo.gov.ru>).

and satisfaction of consumer demands, as well as improvements of the control mechanism and stimulation of scientific studies and technical developments, increase in investments taking into account the patent activity, and optimization of antimonopoly regulation, including the area of the patents pool and license agreements.

2. Advanced Technologies as Basis of Strategic Innovation Development

Revolutionary technologies of our time and their broad practical use serve as the basis of sustainable development, form strategic directions of general scientific and technologic development. Modern directions of developments and technologies provide transition to advanced digital and smart production technologies, robotics systems, new materials, and design techniques, as well as contribute to the creation of large-volume data processing systems, machine learning, and artificial intelligence. Now high technology (as *critical revolutionary technologies*) based on the so-called creative destruction (Schumpeter, 1950) serve as a source of the modern developed countries' economics using revolutionary innovations (*disruptive innovation*) (Christensen, 1997) and are considered to be exclusively important not only as a means of scientific and technological development, but also as a factor providing decisive influence onto national security and economic stability of a state (PwC, 2015).

The strategy of advanced technological development, adopted in many countries of the world, determine priorities of industrial and technical development as a new wave of the 4th Technological Revolution, which includes, in particular: Internet of Things, Smart Everything, Cloud Computing, Big Data, services for business management and data analysis, mobile technologies, social media, and finally the artificial intelligence (AI) systems.

Special attention in the world practice is devoted to developments of AI and robotics. In particular, in 2016, an AI special development plan — National Artificial Intelligence Research and Development Strategic Plan — was adopted in the USA. In Japan, the “New Robot Strategy” program is being implemented. The EU countries established a system of legal regulations in the robotics area (Guidelines on Regulating Robotics), and in February 2017 the European Parliament accepted a resolution on general provisions for civil law regulation in the field of artificial intelligence — Civil Law Rules on Robotics 2015/2103 (INL)⁵.

New technologies transfer has its meaning within international legal acts. For example, Article 7 of the TRIPS Agreement⁶, states that the main objectives of protection and enforcement of intellectual property rights should be promotion of technological innovations, transfer and dissemination of technology to the mutual benefit of producers and users of technical knowledge, thus facilitating socioeconomic well-being and achieving a balance of rights and obligations. In addition, Article 66.2 of the TRIPS Agreement obliges the developed member countries to stimulate companies and enterprises in their territories to transfer technologies to less developed member countries.

3. Technology: Legal Concept and Content

Currently, the level of scientific and technical development allows to create modern complex technologies that combine achievements of different branches of science and technology. Combination of different results of intellectual activity within a single technology and formation of a complex of proprietary (exclusive) intellectual rights for such a technology (patent, trademark, software, know-how) due to a synergy effect of the complex technology results in the need to use hi-tech on a wider scale and in

⁵ Civil Law Rules on Robotics 2015/2103(INL). European Parliament. www.europarl.eu

⁶ WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). www.wto.org.

different areas. Modern technologies are often created in the area of basic technological (industrial) standards, especially in the production sectors where intellectual property rights are widely used (IT-communication area, digital technologies and communication means, computers).

For instance, according to Commission Regulation (EU) No316/2014 of 21 March 2014 "technology" means know-how as well as the following rights, or a combination thereof, including the applications or applications for registration of these rights: (a) patents, (b) utility models, (c) design rights, (d) topographies of semiconductor products, (e) supplementary protection certificates for medicinal products or other products for which such supplementary protection certificates may be obtained, (f) plant breeder's certificates and (g) software copyright. Technology transfer agreements concern the licensing of technology rights. And furthermore, a "technology transfer agreement" means: (i) a technology rights licensing agreement entered into between two undertakings for the purpose of the production of contract products by the licensee and/or its sub-contractor(s), (ii) an assignment of technology rights between two undertakings for the purpose of the production of contract products where part of the risk associated with the exploitation of the technology remains with the assignor.

As the above mentioned Commission Regulation states, there could be two variation of transfer agreement - "reciprocal agreement" and "non-reciprocal agreement". Reciprocal agreement means a technology transfer agreement where two undertakings grant each other, in the same or separate contracts, a technology rights license, and where those licenses concern competing technologies or can be used for the production of competing products. Non-reciprocal agreement implies a technology transfer agreement where one undertaking grants another undertaking a technology rights license, or where two undertakings grant each other such a license but where those licenses do not concern competing technologies and cannot be used for the production of competing products.

A technology transfer in a broader sense assumes a number of processes facilitating the movements of skills, knowledge, ideas, know-how, production procedures, and methods between different participants of the civil (property) turnover. These include both legal entities and individuals: inventors and programmers, universities and scientific research centers, international organizations, commercial and noncommercial identities, state and private organizations, entrepreneurs.

Originally, technology was determined as a set of techniques and methods for obtaining, processing of raw materials, materials, semi-finished products or articles carried out in various industries, in construction, etc. In the early stages of scientific and technological progress, technology was associated with a specific branch of production (construction technology, machine building technology, mining technology, etc.) or with methods of obtaining and processing or reworking the materials (metals technology, plastics technology, fabrics technology, etc.) (Gorodov, 2010). Modern technical development allows speaking about high technologies (hi-tech), science-intensive products, and hi-tech industries, as well as about the whole industries in robotics, microelectronics, microbiology, space, and IT. Information and digital technologies, biotechnology, nanotechnology, the field of genetic engineering constitute the most advanced and demanded sphere of modern technologies.

Technology often means a variety of forms of commercially useful knowledge and information (whether having patent protection or not) that may form a subject of technology transfer deals. For example, the draft of the UNCTAD's International Code of Conduct on the Transfer of Technology⁷ describes "technology" as systematic knowledge for manufacture of a product, application of a method, or provision of services.

⁷ Draft International Code of Conduct on the Transfer of Technology. UNCTAD, 1985.
http://unctad.org/Sections/dite_tobedeleted/ia/docs/compendium/en/14%20volume%201.pdf

However, technology as knowledge can encompass not only the technical knowledge, on which the final product is based, but also the institutional capacity to transform the relevant productive resources into finished goods or services. In other words, technology includes not only knowledge or methods that are necessary to perform or to improve the existing production and distribution of goods and services or to create a new product or method (process), but also entrepreneurial experience and professional secrets of production (know-how) (Maskus, 2003). Moreover, the last two elements often constitute a significant competitive advantage of the technology owner.

In terms of turnover of exclusive (property) rights for the intellectual property objects, transfer of technologies is the legal framework of the transition (transfer) of the exclusive rights from the copyright holder to other persons on the basis of licensing and other agreements for the subsequent practical use of intellectual property (separately or in combination).

The so-called "critical technologies" having important socioeconomic significance or vital for the defense of the country and the security of the state are of paramount importance.

4. Methods of Modern Technologies Transfer

At present, there are various means of transfer of technologies that provide with legally valid use of technology as a bundle of intellectual property rights. Usually, several interrelated processes are understood under a technology transfer: (a) process of dissemination of scientific and technical knowledge; (b) practical use of scientific knowledge; (c) transfer from fundamental knowledge to technical means; (d) adaptation of the existing equipment to a new use. The technology transfer may be carried out basing on different models, i.e., methods of obtaining and using the technology by an interested party on the basis of variable methods of transfer IP rights for industrial property by its owner proceeding from the existing global practice (Falvey et al., 2006; Sampath & Roffe, 2012). The authors include the following methods of exclusive (property) IP right transfer to technology.

Purchase of Technology is a transfer of a copyright or other exclusive (property) IP right of intellectual property objects (work of art, inventions, industrial models, trademarks, computer programs, topologies, etc.) by a copyright holder (patent owner) to another person under a contract or in other legal way. IP right could be transferred simultaneously with the purchase of the technological equipment or other assets for industrial application of a new technology, including crossborder transactions for import and export of goods and technology. Purchase of a technology could be made along with of acquisition of a company, when a company is acquired (merged) with its tangible and intangible assets (IP rights).

A license agreement is the most common technology transfer method of granting the right to use the technology by virtue of an exclusive (or plane) license agreement. The license agreement differs from other agreements by the fact that its subject is the exclusive IP right where a licensor grants a licensee the right to use a certain intellectual property object (invention, industrial model, know-how, software, trademark, etc.).

A patent pool license agreement specifies, that the parties (patent rights holders) sign an agreement on granting the right to mutual use (license) of the technology, thus creating a so-called joint licensing scheme. In addition, **technology pools** are become widely used as a special form of technology transfer now (Cook, 2014).

The technological pools have been admitted by the European Union regulations (Article 101 of EU, 2014/C 89/3). The **technology pools** are defined as "arrangement whereby two or more parties assemble a package of technology which is licensed not only to contributors to the pool but also to third parties. Technology pools can take the form of simple arrangements between a limited number of parties or of

elaborate organizational arrangements whereby the organization of the licensing of the pooled technologies is entrusted to a separate entity. In both cases the pool may allow licensees to operate on the market on the basis of a single license. The agreements, according to which two or more parties form a package of technologies that is intended for use based on license agreements not only by the pool participants but also by third parties". Besides, licensing of technology rights may serve as a means of settling disputes or avoiding that one party exercises its intellectual property rights to prevent the other party from exploiting its own technology rights in settlement agreements. A licensing agreement whereby the parties cross license each other and impose restrictions on the use of their technologies, including restrictions on the licensing to third parties, are entitled each other to use each other's technology and the agreement extends to future developments, is defined as ***cross license agreement***.

A right to integrated technology in the Russian legal system is essentially an independent institution for creation and dissemination (transfer) of technology. It is signified by Russian Law (See Chapter 77 of Part 4 of the Civil Code of the Russian Federation) as a result of scientific and technological ***integrated technology*** activities of IP rightholder, that includes a particular combination of inventions, utility models, industrial samples, computer programs, or other results of intellectual activities subject to legal protection in accordance with the law and may serve as the technological foundation of a certain practical activity in a civil or military area (integrated technology). The right for the integrated technology is defined by the Civil Code of the Russian Federation as a distinct IP right confer to a person (legal identity) who has created ***integrated technology*** as a package of IP objects (copyright, patents, utility models, design rights, topographies of semiconductor products, software copyright). But the integrated technology as the complex product that systemically integrates various technical innovations is not included in the list of protected objects of intellectual property. According to the law, the integrated technology may also include the results of intellectual activity that are not subject to legal protection, including the technical data and other information.

The rights for technology transfer (in full or in part having the distinct legal nature) are accomplished by signing any license or alienation (sale) agreement. It is important to note that the rights for technology include the transfer of the bundle of the IP rights to the intellectual property objects as part of the technology, in particular the exclusive rights or rights to exploit objects of IP rights.

Direct investments (*including foreign investments*) serve as one of the most common technology transfer methods. Investments are done in the form of creation of joint ventures with foreign charter capital, whose composition shall include, in addition to other assets, the property rights for intellectual property protected by patents or other forms of legal protection of the intellectual property. As an investment, the technology transfer is a more dynamic process than investments in other assets that depend on geography, availability, and size of the market of technology application, availability of qualified labor, design cost of the technology implementation at a new place. Susceptibility to new technology largely determines the investment climate in a certain country.

Establishment of a **joint venture** involves the creation of a new legal entity by combining the contributions to the charter capital of two or more founders (companies, individuals). In the process of establishment of new technological companies, in addition to property, property (exclusive) rights for inventions and other protected objects of intellectual property (forming a technology) as are also contributed nonmaterial assets. Cases of establishment of innovation enterprises, associations, partnerships are also included into this category when the intellectual property rights are invested into the charter funds of newly organized companies (patent portfolios, brands, software, etc.).

A particular type of investing in technology is the production sharing agreements providing for implementation of the national and foreign investments in the search, exploration, and extraction of

minerals of a state, its continental shelf, and/or inside the exclusive economic zone on conditions of this agreement. Implementation of the agreement of such a type is not possible without the investor's ownership of advanced technologies and their use in operation.

The investment forms of the technology transfer are also the accomplishment of the turn-key construction with involvement of transfer of the technologies in the framework of the construction contract.

The know-how transfer (package of practical information, resulting from experience and testing), **consulting agreements, and engineering agreements** represent traditional forms of knowledge, skills, and technologies transfer. Confidential information of any kind (manufacturing, technical, economic, organizational, etc.) of science or technology as well as information on professional activity is recognized as know-how since it is thought to be commercially valuable due to its being unknown and classified to third parties. The know-how can be transferred in a material form as documents, photos, drawings, specifications and maps, computer programs and microfilms, calculations and equipment positioning diagrams, descriptions, instructions or manuals, methods and generalizations of practices of different processes organization. Trade secrets can be also transferred during the personnel training or installation and operation of the equipment and technological processes.

The transfer of know-how can be carried out on the basis of a separate know-how transfer agreement, but more often it is transferred in a package with a license agreement or sale contracts of technology alienation. **Consulting and engineering agreements, management contracts, technical-assistance contracts**, as forms of the technologies transfer, provide consulting and other services related to the creation, acquisition, and/or practical implementation of a certain technology, in particular with a view to acquiring advanced technologies (including those from abroad). In this case, besides providing certain assistance in acquiring technologies, the accumulated experience and consultants' knowledge, which are invaluable for acquisition and use of modern technologies, are transferred as well.

Commercial concession and franchising are common ways of modern technology transfer in commercial activity. The transfer of commercial technologies for selling goods and providing services may occur by means of signing a concession agreement or franchising contracts and distributing contracts, in accordance to which the business reputation, technical information, IP rights, and commercial experience of a party transferring such technology and commercial secrets are combined with investments of another party for the purposes of selling goods and providing services directly to the customers.

Usually, according to the franchising agreement, the rights holder (franchiser) provides to another party (franchisee) the right to use a complex of exclusive rights for a trademark, commercial or manufacturing secrets (know-how), while providing a set of services (goods) of the established quality and assortment in exchange for direct or indirect financial reward with the purpose of selling goods or services of the franchiser according to the predetermined rules of conducting business that are determined and controlled by the franchiser in the period of the signed agreement validity. The license under the franchising agreement assumes a transfer of trade secrets and manufacturing secrets (know-how) expressed in provision of technical information, technical services, technical assistance, or services of production management, technology of marketing, service, and administration.

R&D agreements imply development (often joint development by a few organizations) of new technologies, as well as scientific and production cooperation with exchange of new technological results (developments). A special category of contracts includes the **agreements on venture capital investments** and **start-up agreements** in case of advanced scientific and technical developments of R&D stages that envisage a provision of IP rights in different ways: exclusive license, granting the rights of the co-owner of

the technology as a sale or share of a patent, direct investments in scientific and technical result with the right for future revenues, etc.

As an independent way of a technology transfer, the so-called **open technologies** (patent commons), i.e., provision of a free access to the patent portfolio without royalty payment but with certain limitations and conditions of using such technology may be singled out.

The current period of legal system development is associated with the active influence of new digital technologies. The detailed assessment of such influence, advancement of new legal definitions, mechanisms, and legal structures to optimize changes due to modern digital technologies without destroying legal environment, in the evolution mode of "digitizing" legal institutions, is the most important task of the current legal science. Information and communication technologies are becoming an essential part of strategic development directions of different countries, provide a significant influence on a progress of traditional areas of economics, and have already become a component of modern management systems in all areas of economics, state management, cyber security and law enforcement (Kartskhiya, 2017). Currently, the most actual task is to use modern technologies in different areas, as well as there is a need to implement new digital technologies (artificial intelligence, robotic devices, blockchain, IT technology etc.).

5. Conclusions

It is impossible to successfully create, disseminate, and efficiently implement the advanced technologies without using legal models of transfer of the IP rights. Incentive mechanism for creation and transfer of new technology serves as a key factor of sustainable development during the period of digital technology revolution. In the innovation cycle, during the current period of digital technology revolution, the legislation should assure progressive innovative and sustainable development along with creation and transfer of the modern technology. Application of advanced technical innovations IT and Internet technology with advantages of artificial intelligence, cloud technology, and analytical databases is capable to assure a new digital approach to modern legislation.

Summary

Creation, distribution, and transfer of modern technologies are the essential conditions of modern sustainable development. The authors proceed from the assumption that legal tools for the creation, use, and protection of advanced technologies support the technology transfer process from the owner to interested parties for further practical and commercial application or further improvement. The concept of technology, legal ways of using modern technologies, stages of their implementation and practical application are analyzed in the article from legal positions. The legal mechanism combined with the modern means of innovative development stimulates the creation and transfer of new technologies, and at the same time it serves as the key factor for sustainable development in the context of the modern digital technology revolution. In the modern digital revolution conditions, the technology transfer acquires new features and ways for the dissemination of technical innovation, which creates new challenges for legal theory and practice, and legal tools shall correspond to challenges of the time.

References

- BCG Focus (2015). Industry 4.0: The Future of Productivity and Growth in Manufacturing Industries. April 2015. Available at: <https://www.bcg.com/>.
- Bouchoux, D. E. (2017). Intellectual Property: The Law of Trademarks, Copyrights, Patents, and Trade Secrets. Cengage learning.
- Christensen, C. M. (1997). The Innovator's Dilemma. When New Technologies Cause Great Firms to Fail. Boston: Harvard Business School Press.
- Cook, T. (2014). The New EU Guidelines of Technology Transfer Agreements. Journal of Intellectual Property Rights, 19, 229-233. <http://nopr.niscair.res.in/bitstream/123456789/28930/1/JIPR%2019%283%29%20229-233.pdf>
- European Union (2013). European Competitiveness Report 2013 «Towards knowledge-driven Reindustrialization». EC Report, 2013. Available at: <http://ec.europa.eu/>
- European Union (2014). Guidelines on the application of Article 101 of the Treaty on the Functioning of the European Union to technology transfer agreements. Communication from the Commission (2014). 2014/C 89/03/. P.44-45. Available at: [http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0328\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0328(01)&from=EN)
- European Union (2014). Technology Transfer Block Exemption Regulation (the TTBER). COMMISSION REGULATION (EU) No 316/2014 of 21 March 2014 on the application of Article 101(3) of the Treaty on the Functioning of the European Union to categories of technology transfer agreements. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R0316>.
- European Union (2014). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions. Brussels, 22.1.2014 COM (2014). Available at: <http://eur-lex.europa.eu/>
- Falvey, R.; Foster, N. & Memedovic, O. (2006). The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence. UNIDO, Vienna. 2006. Available at: <http://www.unido.org>
- Gorodov, O. A. (2010). Legal protection and use of integrated technologies created on or using budget means. Moscow: Walters Kluver.
- Kartskhiya, A. A. (2017). Digital imperative: new technologies create new reality. Intellectual property, 8, 17-25.
- Maskus, K. E. (2003). Transfer of technology and technological capacity building. ICTSD-UNCTAD.
- PwC (2015). The World in 2050. Will the shift in global economic power continue?. Available at: www.pwc.co.uk/economics
- Sampath, P. & Roffe, P. (2012). Unpacking the International Technology Transfer Debate: Fifty Years and Beyond. International Centre for Trade and Sustainable Development (ICTSD). Geneva, Switzerland, 2012. Available at: www.ictsd.org
- Schumpeter, J. A. (1950). Capitalism, Socialism, and Democracy (3rd ed.). New York: Harper and Brothers.

Stim, R. W. (2000). Intellectual Property: Patents, Trademarks and Copyrights. West legal studies.

The Civil Code of the Russian Federation, Chapter 77, Part 4.

WIPO (2017). Licensing and Technology Transfer. Available at: <http://www.wipo.int>