

*Rasim M. Alguliyev*<sup>1</sup>, *Rasim Sh. Mahmudov*<sup>2</sup>

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<sup>1,2</sup>Institute of Information Technology, ANAS, Baku, Azerbaijan

<sup>1</sup>[secretary@iit.ab.az](mailto:secretary@iit.ab.az) <sup>2</sup>[rasimmahmudov@gmail.com](mailto:rasimmahmudov@gmail.com)

## PROBLEMS OF PROTECTION OF INTELLECTUAL PROPERTY RIGHTS IN THE INFORMATION SOCIETY

*The article explores current issues of intellectual property rights. Issues of copyright protection, including plagiarism, piracy, inheritance, the commercialisation of science, patenting and intellectual property insurance issues are analysed. Additional difficulties associated with the Internet environment are discussed. Solving these problems is one of the priorities in the state policies of Azerbaijan. Proposals are suggested to ensure the development of innovative, reliable protection of intellectual property rights in Azerbaijan.*

**Keywords:** *intellectual property, virtual property, copyright, plagiarism, piracy, patents, commercialization of science.*

### Introduction

The process of building a global information society is currently being pursued all over the world. One of the main features of globalisation is the facilitation and acceleration of information and knowledge exchange. In the past, scientific and technical innovations emerged on one continent and spread slowly to other continents, whereas now these innovations are disseminated throughout the world in moments rather than years. This constitutes the essence of global, rapid development throughout the entire world.

Information and knowledge in the global information society have become the primary strategic products and the means of creating material wealth. The role of innovations, creative labour, intellectual property, and information products has grown in the new economy. In developing countries, the private share of products obtained from information and knowledge has increased as a portion of the gross domestic product. Under these conditions, the issues of copyright and the protection of intellectual property have become significant. Intellectual property such as scientific works, discoveries, innovations, labour-saving suggestions and industrial applications have resulted from scientific activity. Thus, the protection that copyright and intellectual property rights offer has a prominent role in fulfilling the vital interests of scientists.

Recently, the scope of information technologies, especially for the intellectual property objects that result from scientific activity, has further expanded in tandem with Internet development. As a result of the broad application of information technologies, electronic versions of scientific works in traditional format have been created, including intellectual property objects designed only for the virtual environment such as computer software, websites, databases, computation clouds, the “Internet of things”, and networks. These developments have created new opportunities for scientific activity and have led to the founding of electronic science, a discipline which facilitates the global cooperation of scientific researchers, knowledge exchange and the use of geographically shared scientific resources such as software tools, network resources and databases and other information sources. Under these conditions, a topic of paramount importance is the protection of objects resulting from Internet-based scientific activity within the framework of intellectual property rights.

Azerbaijan is among the countries interested in developing an information society with the knowledge economy as its basis. The United Nations Development Programme (UNDP) Development Concept “Azerbaijan 2020: The Vision of the Future” defines the development directions of the country in the near future, reflecting this interest [1]. The document includes provisions for the development of science, human capital accumulation, the formation of the

knowledge economy, science-intensive technology and the broadening of innovation activity to accelerate the creation of products and services.

Based on the “The National Strategy on Development of the Information Society in the Republic of Azerbaijan for 2014–2020” [2] adopted in accordance with “Azerbaijan 2020: The Vision of the Future”, broad and comprehensive reforms are pursued in ANAS. The priorities of fundamental and applied research are delineated in terms of the formation of the knowledge economy in Azerbaijan and the commercialisation and promotion of scientific products, which is the mission of ANAS. One of the emerging issues is the need for the protection suffered by copyrights and intellectual property regulations because the scientists of Azerbaijan participate in nationwide and international projects, but their work is not protected by these legal measures. In cases when scientists’ copyrights and intellectual property are not sufficiently protected, they are deprived of material gain from their work. In addition, the economic security of the country may be jeopardised.

### **Principal duties related to the protection of intellectual property rights**

Three principal methods of intellectual property protection currently exist globally: copyrights, patents and commercial secrets.

Other methods of intellectual property protection have also been applied [3]:

- Moral-ethical norms;
- Administrative measures (e.g., the organisation of a confidentiality regime, the establishment of security services and staff training);
- Physical protection measures (locking doors and windows, etc.);
- Technical protection systems (electromechanical, acoustic, radio-technical, magnetometric, etc.);
- Cryptographic methods (the modification of information to conceal its logical essence);
- Labour contracts with potential dismissal (employees are obligated to not reveal commercial secrets).

Protecting intellectual property rights has become increasingly crucial with the development of the Internet, which has undermined the traditional concept of the copyright. Internet tools can be used to copy materials and globally disseminate them at a low cost. There is a delicate balance between the interests of the creators of intellectual property objects and the interest in promoting the creative activity of society and increasing public knowledge. The prevention of the unlimited copying of materials and the preservation of opportunities to use those materials is one of the most highly discussed topics in Internet regulation. On the Internet, when intellectual property rights are not protected, scientists and researchers may not materially gain from their work, resulting in a potential decrease in scientific creativity [4]. Considering the global nature of the Internet, it is essential to unify national legislative frameworks for the digital rights of authors. The most effective tool to unify legislative frameworks on intellectual property rights is the international convention.

As established, the protection of intellectual property rights with traditional methods is not effective. Thus, the interests of the owners of these rights must first be protected with technical and software-based methods. Due to the rapid development of information technologies, new protection systems are required. Yet, the issue of protecting intellectual property rights is complex for the following reasons [5]:

- the violations occur not only through the Internet, but also through other mass media tools;
- using these tools, the following violations occur: plagiarism, piracy, illegal trade of the objects of intellectual property rights and the purchase of products via online markets without permission;
- different objects of intellectual property rights are subject to violations;

- the violations are transnational;
- the violations are in most cases accompanied by other publicly hazardous actions including the spread of malicious programs and spam and the violation of private information.

Because the Internet has a global scope, the problems regarding the protection of intellectual property necessarily involve global cooperation for their resolution. Each country must contribute to the solution of this problem, and the cooperation of higher education institutions is important in the protection of copyrights and scientists' intellectual property. In addition, there is a fundamental contradiction between local intellectual property rights and the virtual, global features of the Internet. This contradiction creates major difficulties in applying traditional legal frameworks to the protection of intellectual property. The absence of national boundaries on the Internet requires the development and adoption of international norms directed toward unification of the appropriate national legal systems. In Azerbaijan, this means that the global and virtual characteristics of the Internet must be considered in its national legal framework for protecting intellectual property.

Although the norms regarding the protection of copyrights and intellectual property are included in several international agreements adopted so far, they regulate the most common issues and do not solve several conflicts that have arisen in this field [4]. Hence, the adoption of an international convention regarding the protection of intellectual property on the Internet is needed. Presently, three methods of copyright protection in the virtual environment are applied in practice. The first method implies the elimination of the term "copyright" and the free use of an author's work when the author has been referenced. The second involves the payment of a fee to an author when using Internet resources. The latter variant considers the specification of legal framework and the restriction of user rights to some extent. The second variant is preferred in the legal framework of Azerbaijan [6].

The United Nations Educational, Scientific and Cultural Organization (UNESCO) document "Recommendations Concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace" advises member countries to update their national legislation regarding copyrights and adapt it to cyberspace by considering the balance between the interests of authors and society [7]. Yet, no country has adopted a strategy for attaining this balance between the producers and consumers of digital products. In Azerbaijan, a systematic state policy for scientific development was documented in the "National Strategy for Development of Science in the Republic of Azerbaijan for 2009–2015", which recommends the broadening of innovative activity, the stimulation of scientists' work and the protection of legal interests at a high level [8].

One of the main aspects of protecting the copyrights and intellectual property of scientific researchers is the strengthening of a legal framework that includes the recommendations of the World Intellectual Property Organisation and other international institutions. In Azerbaijan [6] conceptual documents and regulatory actions have been adopted in this field. A section is devoted to this issue [1] in the UNDP Development Concept "Azerbaijan 2020: The Vision of the Future". Access to several objects protected by intellectual property rights will be established through a global digital network, online licensing and a digital rights management system.

### **The issues in the struggle against plagiarism**

One example of a copyright violation is plagiarism. The development of the Internet, the digitalisation of texts, and the ease of copying have escalated this issue. Plagiarism is widespread among students, scientific researchers and journalists, and this problem is clearly manifested in the field of scientific activity.

In the legal literature, a deliberate appropriation of literature, cultural and scientific works, or innovations belonging to others is understood as plagiarism, although the use of ideas,

concepts, methods and information is not considered plagiarism [9]. Plagiarism is generally considered the appropriation of someone else's intellectual labour and can occur when a portion of someone's work is referenced without indicating the source. An unjustified claim of co-authorship of a particular work is also considered plagiarism. Yet, plagiarism does not only refer to published work. The appropriation of work in the form of an unpublished manuscript is also an act of plagiarism. While writing a scientific work, particular standards must be followed to avoid plagiarism. That is, when using the ideas and research of others, the sources must be appropriately cited.

For the prevention of acts of plagiarism, the adoption of moral or ethical, legal and technological measures is necessary. With the help of information and communications technology (ICT), new methods and tools are available to combat plagiarism in a virtual environment. Anti-plagiarism software is a useful tool, but of course there are literature sources that do not have electronic versions. Thus, not all cases of plagiarism can be exposed with the help of software programs. Also, the automatic identification of acts of plagiarism resulting from the violation of ethics is not possible with ICT. For example, "agreed" plagiarism, the illegal co-authorship of ideas, has emerged for different reasons (e.g., relationships with supervisors, friends, and relatives), and "ordered" plagiarism, the practice of becoming an author or co-author by paying for someone's ideas, exist due to economic, social and other factors. Another type of plagiarism which is widespread is "anonymous" plagiarism. The elimination of these actions is not possible by applying any technical software tools [10].

The "National Strategy for Development of Science in the Republic of Azerbaijan for 2009–2015", includes the planning and execution of projects such as the integration of Azerbaijan's scientific activities with the international scientific environment, the publication of scientific works in prestigious foreign journals, and participation in international markets [8]. Thereby, plagiarism must be handled with an awareness of the purpose of protecting the rights of Azerbaijan scientists and the prestige of Azerbaijan science.

Civil and criminal law in countries including Azerbaijan contain provisions for assigning responsibility for plagiarism. Also, the regulations of several countries enforce the penalty of dismissal of students who have committed plagiarism [11]. Based on global practice, the consideration of plagiarism in scientific research and higher education institutions in Azerbaijan is a crucial issue. Thus, it is advisable to develop a unified scientific ethics code for researchers in Azerbaijan. The consideration of the responsibility of a researcher who committed plagiarism should be codified to effectively address this problem.

### **The issues in the struggle against piracy**

Another copyright violation is piracy, and researchers engaged in scientific and technical activity are especially affected by it because books and software can be easily copied and sold with the help of modern ICT tools. In a legal sense, piracy is the production (manufacturing) and dissemination of a pirated product including copies of audio-visual work, phonograms, computer software, databases and books [12]. According to the literature, the largest amount of piracy occurs in book publishing and the audio-visual sphere.

According to the law of the Republic of Azerbaijan "On Copyrights and Related Rights", the use or dissemination of pirated software in any format is a violation of copyright ownership [13]. In 2012 the "Law of the Republic of Azerbaijan on Enforcement of the Intellectual Property Rights and the Fight Against Piracy" was adopted [13]. This law regulates the protection of intellectual property rights and the interests of intellectual property rights owners, and it prevents violations of the law including the illegal production and dissemination of copies of intellectual property objects. In this regulation, criminal, civil and administrative responsibilities are considered for violations. According to the Copyright Agency of the Republic of Azerbaijan, the level of piracy decreased from 61% to 30% in 2014, including a

reduction from 90% to 66% in the audio-video product market and from 96% to 85% in the software market [6]. Despite the positive results achieved in this field, serious problems (specifically, software-related) remain.

One of the most effective methods of combatting plagiarism is the electronic registration of an author's works. Unlike traditional methods, electronic registration is transparent and efficient in terms of saving authors' time and financial resources, as the work is instantly registered with an electronic service. According to official information, authors are not interested in electronic registration of their works in Azerbaijan. Because this impedes efforts to reduce plagiarism, an appropriate advertising campaign to persuade authors must be initiated.

Piracy was widespread before the emergence of the Internet, but the Internet has increased its occurrence. Despite the consideration of particular measures of responsibility for piracy in Azerbaijan's legislation, the virtual and global characteristics of the Internet have not been considered. It is not possible to eradicate this illegal activity with traditional methods in the domain of the Internet. In general, an effort to address violations of intellectual property rights must be approached through global legal regulation; in other words, the struggle against Internet-related illegal activities requires international cooperation. However, countries with low standards of living are not very interested in combatting piracy because it is very cheap or free to obtain pirated products. Hence, software manufacturers must pursue a preferential price policy for poor countries to minimise acts of piracy.

### **The commercialisation of science and the problems concerning patents**

Another important problem concerning the protection of intellectual property rights is related to issues of commercialising scientific activity and patenting. Commercialisation is the process of transforming knowledge into a product, service or an activity to make a profit. The process of commercialising innovations (the transfer of technologies) involves introducing an innovation to a market and transferring knowledge and information [14]. At the initial stages of scientific developments, commercialisation involves patent research, technological auditing and studying markets and market conditions. Not solving these problems causes the inefficient use of intellectual and financial resources. Commercialisation is not always an activity achievable by a researcher. The determination of how to apply new knowledge and experience for the purpose of commercialisation is handled within the profession of the management of intellectual capital.

A patent, the principal legal mechanism when commercialising scientific knowledge, is an enforcement document assigned by the government body responsible for overseeing inventions and industrial applications [15]. In a traditional sense, a patent mainly protects a new process or a product. The patent grants the owner the right to prevent the use of the invention described in the patent for commercial purposes (e.g., production, application, usage, sale, and bids for sale or import) by third parties. The patent owner can sell or transfer these rights to another person by licensing the patent. Software is already subject to patent rights, and a rapid increase in the number of registered patents has increased the volume of legal cases related to software manufacturers [5].

Currently, Azerbaijani scientists are not able to present scientific results, inventions, and findings which have been successfully applied in the commercial, production and services spheres. The patent departments during the Soviet period were active, and patent support was provided for inventions. Thereafter, the activities of these departments have become ineffectual and do not meet the current requirements.

Azerbaijani scientists may profit from transforming scientific findings into products and promoting those locally and globally. Although Azerbaijani scientists can obtain patents, they are not recognised in Europe and America. The reason is the noncompliance of patent legislation in Azerbaijan with international legal practices. Hence, the adaptation of national legislation to international standards is important. The law "On Patents" adopted in Azerbaijan in 2010

regulates the property relations arising from the creation, legal enforcement and use of inventions, models, industrial applications and the personal non-property relations related to those [15], but these are the only recognized patentable objects. However, in the patent legislation of advanced countries, software tools are also protected by patent rights. Azerbaijan has taken an innovative development path in which special attention is paid to the development of technologies and to the manufacturing of software tools, in which start-up projects are performed with state support. Hence, the addition of software tools to the list of patentable items in the national legislation is necessary.

In the law “On Patents”, the state encourages the creation and use of inventions, models and industrial applications, and can specify concessions, including soft loans to authors, patent owners and entities. However, the enforcement of this law is not possible in Azerbaijan; whereas in developed countries, the commercialisation of scientific and technological innovations is possible with the following three methods [14]:

- the search for non-returnable budget financing at all stages of project realisation;
- the search for bank financing;
- the search for commercialisation.

The transfer of commercialisation and technologies is at the root of innovation processes. For instance, one of the main features of technoparks is the commercialisation and the transfer of technologies. In general, to stimulate the commercialisation of scientific and technical projects, the improvement of Azerbaijan’s national legislative framework is necessary in the following areas [14, 16]:

- the assignation of responsibility for the commercialisation of scientific research results;
- the creation of a legal environment for new, small innovation enterprises that apply the results of scientific research;
- the development of infrastructure for the improvement of commercialisation of technologies;
- the formation of legal foundations for the development of state-private sector cooperation in the field of commercialisation of technologies.

### **Personnel training and the issues of stimulating innovative thinking**

One of the principal problems in the field of protection of intellectual property rights is related to personnel training and the education of high-level experts. The requirements of an information and knowledge society must be considered in scientific personnel training, and attention should be paid to developing an appropriate culture among scientists and experts. Azerbaijani scientists do not currently possess the necessary knowledge for obtaining patents and copyrights because there is no means of gaining this knowledge in higher education, including the doctoral level. Yet, knowledge has become a major source of income, so scientists must possess the knowledge to protect their innovative ideas, copyrights and intellectual property. Professional workers must be trained in the current requirements for the protection of intellectual property rights and copyrights; this should be part of the legal education system. The positive experience of developed countries in this realm must be studied and applied. At all education levels, training programs must be conducted to transfer this knowledge. One means to accomplish this could be similar to training courses offered by the Academy of the World Intellectual Property Organisation, which organises courses on copyrights and intellectual property in different countries [17] with different teaching models for trainees, scientific researchers and experts. The organisation of these courses in Azerbaijan could greatly contribute to the training of professional workers on intellectual property rights.

Overall, the following issues must be solved for the development of human capital to increase innovation [18]:

- The engagement of youth in science and the promotion of the profession of researcher and the attractiveness of a scientific career;
- Improvement in the mobility of employees of scientific institutions;
- An increase in number of students studying the profession of business administration;
- Innovation and production activity based on clusters.

Another important issue is the formation of innovation culture and a higher status for innovators. To achieve this, it is important to disseminate successful innovation practices in the management and social spheres and promote the role of innovations in the development of society and the economy. It is important to popularize science, innovations and innovation activity through advertising, the engagement of public opinion leaders, and competitions among enterprises, scientists and students. To popularise innovation activities, teaching special courses on innovation at higher education institutions is necessary.

### **The issue of inheritance of intellectual property**

The solution of inheritance issues related to traditional copyrights has been addressed in national legislation in many countries, including Azerbaijan. According to the law of the Republic of Azerbaijan on copyrights and related rights, if an author is a juridical person, copyright ownership is inherited based on the law or testament in order of succession [13]. Unlike several other countries, no right of inheritance concerning patents is presumed in Azerbaijan.

With the emergence of the Internet, new questions have arisen regarding inheritance issues for intellectual property. The first question involves whether Internet enterprises are physical or intellectual property. Despite the existence of a legal tradition regarding the inheritance of physical property; no practice exists regarding virtual property. Second, how should inheritance issues regarding websites, email address, social networks, and private pages on forums be solved? Corresponding international conventions do not address these issues. Some legal decisions have a precedent role regarding these issues. For example, the parents of American soldiers who died during the Iraq war have appealed in court to obtain the passwords of private Facebook profiles as legal inheritors, and the court decided in their favour [5].

### **The issues of insurance and valuation of intellectual property**

The purpose of insurance is to protect property from destruction, loss and incurred damage. It is possible to insure all kinds of material property, but the insurance of intellectual property, which is considered to be a nonmaterial asset, is not possible in a traditional sense. The insurance of intellectual property objects is a method of risk minimisation accompanied by the turnover of intellectual property objects [19]. When discussing the insurance of intellectual property, specifying the object of protection and how to protect it are complicated matters, and no comprehensive solution currently exists.

One of the main problems regarding the insurance of intellectual property is related to the identification of potential risks. Another important problem concerns the determination of the scope of damage incurred to insured intellectual property. In insurance markets of developed countries, there is currently a large demand for the insurance of intellectual property, but insurance against damage incurred does not exist. A simple example is a case in which dozens of illegal copies of a work are made, but the pirated products can then be turned into millions of additional copies. In this case, the insurer is not able to calculate the loss from damage incurred. Hence, despite the large demand, insurance companies do not provide such services, although it is possible to approximately calculate potential court expenses. Although the demand for such services is very low, insurance companies in the US provide such services [19].

The most complicated issue regarding the insurance of intellectual property is the specification of an insurance tariff because it is based on the mathematical probability of the

occurrence of an insurance event and the statistics from the previous period. As in many countries of the world, such a statistical database has not been established in Azerbaijan. Globally, the problem of valuation of intellectual property remains an issue. At present, intellectual property constitutes one of the important assets of enterprises. The valuation of intellectual property is a value assessment of a nonmaterial asset that characterizes its potential effectiveness, determined by the degree of technological and production innovation.

The features of risks related to turnover of intellectual property objects are determined by the intellectual labour and the form of intellectual product. These risks can be divided into two groups: risks related to copyrights and risks related to intellectual industrial property.

The risks related to intellectual property are as follows [20]:

- The loss of property: the loss or damage of a document, information risks (the damage to, loss or stealing of information) and the defects in patenting;
- Failure to obtain income or loss: production through piracy, plagiarism, the emergence of a similar product based on other intellectual property objects and changes in patent legislation;
- Third-party liability: court expenses for unintentional violations of the rights of third parties or the professional liability of a patent attorney.

While performing the activities of innovative entrepreneurship, the use of intellectual property objects may lead to court proceedings. Additional costs are needed for the recourse of parties in such court proceedings (e.g., consultations, the remuneration of advocates, fees for court claims and penalties). The risks related to such costs in the turnover of intellectual property objects can be insured. Another problem that has yet to be solved at an international level is related to the insurance of virtual property. The primary problem concerning the insurance of virtual property objects is the protection of information security, including the confidentiality and completeness of information. Hacker attacks on virtual property objects have increased, and the damage incurred by them is comparable to damages to physical property such as fire or natural disasters. Insurance companies in Azerbaijan do not currently provide services concerning the objects of intellectual property. This is related to these issues not being regulated through national legislation. Also, the concept of virtual property is not specified in legislation in Azerbaijan.

### **Conclusion**

For sustainable and innovative development, the principal issue is the creation of an appropriate ecosystem. One of the main aspects of this ecosystem is the creation of a legal framework and its flexible improvement in accordance with its development features. Without the secure maintenance of protection of intellectual property rights, it is not possible to achieve competitive innovative development in the global economy. In “Azerbaijan 2020: The Vision of the Future” Development Concept, the national strategy concerning intellectual property and the goal of adopting programs to manage intellectual property issues are addressed. Ideas and knowledge constitute the basis of innovative development, and scientists and experts create that knowledge. Hence, in the national strategy and corresponding programs to be adopted, it is important to safeguard scientists’ interests at a higher level to increase productivity. Considering the global and virtual features of the Internet, which is a driving force of innovative development, several legal issues need to be resolved concerning the commercialisation of science, patents, copyright ownership, plagiarism, patenting, inheritance and the insurance of intellectual property.

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