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Digital Technologies in the National Cadastre System of Uzbekistan: Issues of Legal Regulation

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Keywords

artificial intelligence,
cadastre infomation,
digital technologies,
ethics,
law,
legal regulation,
national legislation,
special legal regime,
state cadastre,
Uzbekistan

Abstract

Objective: to critically analyze the state of national legislation of Uzbekistan in terms of legal regulation of digitalization and the use of artificial intelligence in the cadastral sphere.

Methods: the research is based on such methods of scientific cognition as formal-legal and comparative-legal analysis, induction and deduction.

Results: the provisions that regulate digitalization and the use of artificial intelligence in the cadastral sphere were analyzed, legal gaps were identified. It was determined that the practical application of artificial intelligence technologies outpaces its legal regulation. The shortcomings of legal regulation in this sphere were noted (lacking legal definition of the legal status of artificial intelligence in the national legislation; regulation of business entities' participation in the management of artificial intelligence, etc.). The said shortcomings hinder its full application and harmonization with traditional sources of cadastral information. The author substantiated the need for universal digitization of the national cadastre and predicts the possibility of wider application of artificial intelligence in the natural-resource cadastral system. It is argued that the existing system in its current state may lead to wrong decisions and cadastral errors, hence, it is necessary to improve the legal regulation of cadastre.

Scientific novelty: for the first time the results of the national cadastre digitization were assessed. Forecasts were given about the possibility of using artificial intelligence in this area, subject to further improvement of legal regulation. The latter is fundamentally important for reforming the cadastral system, since the technological basis of this system does not fully meet the needs of the digital economy.

Practical significance: it is due to the lack of legal regulation of the artificial intelligence concept and legal status in the national legislation, as well as a unified approach to the cadastral system digitalization. Modern technologies are actively used in practice, but lack a sufficient legal basis. The main conclusions, proposals and recommendations of the study can be a basis for further improvement of the legal framework of Uzbekistan in terms of the application of artificial intelligence technologies.

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Introduction

The cadastral system of Uzbekistan includes more than 20 types of state cadastres, the objects of which are both natural resources and non-natural objects. This system contains a huge database, which reliability influences the course of economic reforms. Therefore, the application of artificial intelligence (hereinafter – AI) in working with cadastral information is one of the relevant topics of the environmental and cadastral practice in Uzbekistan.

Analysis of the international Government Artificial Intelligence Readiness Index, conducted by Oxford Insights, shows that Uzbekistan is making great efforts in the field of implementation of artificial intelligence technologies. For example, ranking 158th among 160 countries in 2019, Uzbekistan ranked 95th in 2020, 93rd in 2021 and 79th in 2022[1]. Thus, the country's position in the application of artificial intelligence has improved almost twofold in five years. To a great extent, this is due to the application of artificial intelligence in the sphere of cadastre.

[1] Digitalization: Uzbekistan raises its international ranking. (2022, December 29). UZA. https://clck.ru/3CsERN

The publication of the UNESCO Recommendations on Ethical Aspects of Artificial Intelligence in 2021, as well as the adoption by the European Union of the world's first AI Act at the end of 2023, became an impetus for Uzbekistan to further improve the regulatory framework for the application of artificial intelligence technologies (Podshivalov, 2022; Sladić et al., 2020).

The application of artificial intelligence in the national cadastre is still fragmentary, which indicates its latent level. Practical application of artificial intelligence technologies is ahead of its legal regulation and is expressed in the form of 3D, 4D and 5D computer modeling.

In terms of practical results of 3D-models implementation, it is worth mentioning the creation of 3D-models for certain types of mineral resources, envisaged as early as in 2020 within the cadastre of deposits, mineral occurrences and technogenic mineral formations. Creation of 3D models of buildings and structures is widely practiced (Przewięźlikowska, 2020).

Based on the Administrative Regulations on state services on providing information on the history of a real estate (building), it is possible to obtain a certificate on the history of a real estate (building) directly at the State Services Center, or through the Unified Portal of Interactive State Services, or on the website davreestr.uz, which is the first experience of 4D-cadastre.

5D modeling is also successfully applied to such objects as industrial enterprises, boiler houses, logistics centers, shopping centers and other complex property units. In particular, the official website of the Cadastre Agency https://kadastr.uz/ru/kadastr-qiymatini-hisoblash provides a service for calculating the value of buildings based on a BIM model of the building.

However, artificial intelligence does not cover all types of state cadastres and its practical application is not supported by legal regulation.

1. State of legal regulation

1.1. State of the national legislation

The legal regulation of AI application in cadastre is related to the regulation of the legal status of artificial intelligence in general.

As for the general issues of legal regulation of artificial intelligence, Tables 1–3 analyze the fundamental directions of legislation. The national projects using artificial intelligence are funded through international financial institutions, grants, contractors' funds, international grants, Foreign Governmental Financial Organization and alliances.

Table 1. Law-making activity in the sphere of AI application

No.	Legal act	Presence
1	Law "On artificial intelligence"	no
2	Strategy for artificial intelligence development	no
3	National standards in the sphere of artificial intelligence application	no
4	Ethical code of using artificial intelligence	no
5	Special regime of using artificial intelligence technologies	yes

Table 2. Education in the sphere of artificial intelligence

Higher professional education		Post-university education	
special	juridical	special	juridical
231 quotas for Bachelor students, 14 quotas for Master students majoring in “Artificial intelligence” in six national universities	no	5 quotas for doctoral students and independent research in “Digital technologies and artificial intelligence”	no

Table 3. Information on mineral resources available in open access to implement projects in the sphere of artificial intelligence

Information on	Yes (+) / No (-)
climate and weather conditions	+
vegetation	-
water resources	+
animal world	-
land resources	+
forest resources	-
protected natural zones	-
mineral resources	-

In particular, fundamental and conceptual acts of legal regulation in this sphere are still not adopted, while the special regime of support for AI technologies is limited in time and applies only to residents of IT parks, which, in our opinion, limits the opportunities of other entities engaged in this sphere.

The organizational aspect of governance is limited only to the functioning of a state administrative body and a consulting structure, while there is no private sector participation in the field of AI governance. If we take into account that all over the world the main developers of AI are large private companies[2], then the future of AI application in Uzbekistan will also be concentrated in the hands of business entities. Consequently, their participation in the management of AI should also be regulated.

There is no regulation of teaching legal knowledge as part of the formation of specialized knowledge in the field of AI. Although Tashkent State University of Law (TSUL) is included in the list of universities that introduce training courses and subjects on the applied aspects of artificial intelligence technologies in the system of public administration, the target indicators for personnel training (bachelor’s, master’s and doctoral studies) in the field of AI application have not been developed. Insufficient attention to the development of general scientific activity is obvious against the background of the almost absent legal scientific activity.

[2] According to 2023 statistics, the world’s largest IT companies are Google, OpenAI, Microsoft, Huawei, Yandex, etc.

Financing of projects with AI is mainly carried out by extra-budgetary funds, with public funding present only in one new institution, the Alliance, which is a combination of finances of state bodies and business entities.

The composition of natural resource data that can be used in algorithms is also limited. Open cadastral information on land and water resources are now used in AI projects, while data on other natural resources are not available.

Analysis of the general legal norms shows that there is no regulation of such concepts as "3D plot", "3D property". All available cadastral information is related to 2D cadastre. The Land Code of the Republic of Uzbekistan states that "a land plot is a part of the land fund having a fixed boundary, area, location, legal regime and other characteristics reflected in the state land cadastre". At the same time, the concept of "land fund" is not defined, but only its constituent parts are listed[3]. The Law "On State Land Cadastre" does not define a land plot[4]. The Law "On Mineral Resources" defines mineral resources as a part of the earth's crust located below the soil, and in its absence – below the earth's surface or the bottom of water bodies, and extending to depths accessible for geological study and development, while a mining allotment is defined as a subsoil plot limited in area and depth[5]. Such objects as bridges, underground facilities, stadiums, engineering communication, tunnels are partially regulated and are the objects of separate cadastres. The Civil Code of the Republic of Uzbekistan understands immovable property as plots of land, subsoil areas, buildings, structures, perennial plantings and other property firmly connected with the land, i.e. objects which cannot be move without disproportionate damage to their purpose[6]. However, the concept of "vertical real estate" is not regulated in the Civil or Urban Planning Codes of the Republic of Uzbekistan[7].

1.2. International norms and their implementation into legislation

The main international norm, the implementation of which in the national legislation we consider appropriate, is the Recommendations on the Ethical Aspects of Artificial Intelligence (hereinafter – the Recommendations), which provide the main criteria for the use of AI today. The document began to be developed back in 2019 and was adopted in November 2021 by the UN General Conference on Education, Science and Culture (UNESCO). The purpose of adopting this document is to regulate the use of AI for peaceful purposes, directing it to serve for the benefit of man, society and the environment (Table 4).

3 The Land Code of the Republic of Uzbekistan. https://clck.ru/3CsFj2

4 The Law of the Republic of Uzbekistan "On State Land Cadastre". https://clck.ru/3CsFjX

5 The Law of the Republic of Uzbekistan "On Mineral Resources". https://clck.ru/3CsFkX

6 The Civil Code of the Republic of Uzbekistan. https://clck.ru/3CsFm9

7 The Urban Planning Codes of the Republic of Uzbekistan. https://clck.ru/3CsFms

Table 4. Ethical values and principles of artificial intelligence activities enshrined in the Recommendations on Ethical Aspects of AI

Values	Principles of activity
– Respect, protection and promotion of human rights and fundamental freedoms and human dignity; – well-being of the environment and ecosystems; – ensuring diversity and inclusion; – living in peaceful, just and interconnected communities	– Proportionality and non-harm; – safety and security; – fairness and non-discrimination; – sustainability; – right to privacy and data protection; – accountability and subordination to the individual; – transparency and explainability; – responsibility and accountability; – awareness and literacy; – multi-stakeholder and adaptive governance and engagement

The above attitudes and principles generally correspond to the fundamental principles of the national cadastral legislation.

Although this act is called Recommendations on Ethical Aspects of Artificial Intelligence, it also contains legal recommendations, which before the adoption of a separate law may serve as legal norms regulating AI use in the countries that have implemented it.

In particular, this document contains recommendations regarding legal liability, delineation of areas in which artificial intelligence can and cannot be used, mandatory control over artificial intelligence by humans, etc.

The use of AI in the sphere of environment and ecosystems, of which natural resource cadastres are an integral part, is an area that requires the adoption of strategic measures for the artificial intelligence application as recommended by the UNO.

Norms directly regulating the application of AI in the field of cadastre are absent in the national legislation.

Comparing the above norms with the Recommendations, we found that they lack some fundamental requirements (Table 5).

Table 5. Consequences related to the drawbacks of legal regulation

Lacking norms	Imbricated with
The concepts of “artificial intelligence” and “artificial intelligence life cycle” are not regulated	Artificial intelligence is identified with traditional objects of legal relations
Minimization of possible negative consequences of AI application	The obtained positive result is devalued, creating a threat to other people
Control of AI activity throughout its life cycle, including public control	Total domination of machines over humans
Limits of human responsibility in AI application	Violation of human rights and interests, when using AI, will remain unpunishable
Guaranteeing the interests of marginalized groups based on the digital divide at the national level	Creates a limited circle of subjects using AI
Mechanism of compensation for harm caused by the application of AI technologies	The right to compensation for material and moral damage will not be implemented
Soft governance system for AI applications	Lack of unified requirements in regulating the activities of AI developers
AI cannot have legal personality	Claims to AI as an independent subject of law, a subject of private and public law

Thus, the above analysis shows that the fundamental principles and guidelines in the sphere of application of AI technologies in Uzbekistan cadastral legislation are partially regulated at present. It should be noted that some provisions of the Recommendations are already in force in the studied area of legislation.

In particular, this concerns the establishment of a transparent system of coordination with private legal entities having publicly significant information. Such a system is in place in the Law "On Environmental Audit"[8], according to which the conclusions of environmental audit are not disclosed without the client's consent.

1.3. Advanced foreign practices

Based on the foreign practice of legal regulation of the use of artificial intelligence in cadastre, the following trends in the use of 3D cadastre can be identified:

– the existence of a separate law regulating the use of 3D cadastre. For example, in China there is a separate law on 3D cadastre, which registers buildings and structures along with land plots that are in exclusive state ownership;

– absence of a separate law, with amendments and additions to the existing legislation regulating the legal status of 3D cadastres. Such countries include Australia (Queensland), Hungary, Sweden, the Netherlands, Poland, Turkey, etc. This system is very flexible, as it is based on the use of land plot boundaries within a two-dimensional cadastre to form information on the 3D cadastre object. At the same time, this system has some disadvantages. For example, when information on an object within the 3D cadastre is formed, information on several land plots within the 2D cadastre is used. This practice may fail in the future, when the issue of legal recognition of 3D cadastres arises;

– the inadmissibility of using 3D cadastre under current legislation, despite its widespread use in practice. In Greece and Cyprus, the use of 3D cadastre is contrary to the Civil Code.

The birthplace of using artificial intelligence in cadastre is Australia. In 1997, it was one of the first countries in the world to introduce 3D modeling in the sphere of real estate cadastre. Therefore, 3D cadastre information is valid equally with 2D and 4D cadastre information. Paper-based cadastral information operates in parallel with electronic information, with the former being characterized by too much detail, whereas 3D is a simple graphical representation. Thus, paper-based and digital cadastral information complement each other. All types of property rights can be registered in both 3D and 2D cadastres. In addition, objects of 3D modeling are distinguished separately: bridges, underground facilities, parking easements, lease agreements, utility networks, pipelines, stadiums and others. A 3D plot may be subject to a lien just like a regular plot, despite the fact that 3D cadastral information is not the final truth in the cadastre.

[8] The Law of the Republic of Uzbekistan "On Environmental Audit". https://clck.ru/3CsGZk

The legislation of Argentina does not regulate the legal status of 3D cadastre, despite its widespread use in practice. In Austria, for all the desire to fully switch to 3D cadastre, digitalization of cadastre is not fully implemented. In Bulgaria there is a partial application of 3D modeling, so, while in Sofia 3D cadastre is considered necessary, in other cities of the country it is not the main source of information. At the same time, the legislation does not regulate its legal status. The Canadian cadastre is characterized by daily updating of cadastral maps, books, and reports, although in fact it is a multi-purpose cadastre; there is no separate law on 3D cadastre, but objects of 3D cadastre are separately regulated.

2. Uzbekistan's experience of applying artificial intelligence

2.1. Normative-legal framework

The absence of a law on the use of artificial intelligence in Uzbekistan is compensated by a limited legal regulation – the Special Regime for the Support of Artificial Intelligence Technologies and the Order of its Functioning, which refers to the order of legal regulation of testing based on artificial intelligence technology, the creation of organizational and legal conditions for legal entities and scientific organizations, the creation of favorable conditions in legal relations during the activities related to developing software and rendering services, testing software and introducing them as part of "smart" regulation[9]. The Regime is a part of the Technological Park of software products and information technologies.

The working body of the Special Regime is the Ministry of Information Technologies and Communications Development of the Republic of Uzbekistan. The tasks of the working body include the following:

– to approve the application form and the list of necessary information to be submitted by applicants for the status of the Special Regime participant, and to organize the reception of applications;

– to approve the charter of the Special Regime Expert Council, as well as the form of the agreement on the terms of functioning to be signed by its participants;

– to form and approve the composition of the Special Regime Expert Council together with interested ministries and agencies;

– to submit proposals on inclusion and exclusion of criminals from the Special Regime to be considered by the Coordination Commission;

– to engage personnel of the Research Institute for the Digital Technologies and Artificial Intelligence Development to monitor the scientific activities of the Special Regime participants;

– to provide organizational, legal and advisory support during the implementation of pilot projects of the Special Regime participants;

[9] Housing Code of the Republic of Uzbekistan. https://clck.ru/3CsGch

– based on the conclusion of the Coordination Commission, to make a decision on granting, rejecting or depriving the project initiators of the status of a Special Regime participant;

– to submit an annual official report to the relevant ministries and departments on the projects successfully implemented by Special Regime participants.

Uzbekistan maintains a special Unified Register of Special Regime Participants, which contains publicly available and open information on legal entities and scientific organizations that are the Special Regime participants – residents of IT parks. To become a Special Regime participant, an application should be submitted to the Coordination Commission.

The legal status of the Special Regime participants is very specific, as the Regulation stipulates only their duties. The rights of the participants are set forth in a bilateral agreement between the Coordination Commission and the participant. The Regulation provides great preferences and benefits to the Special Regime participants. In particular, the funds spent on professional development and retraining of personnel are compensated; the right is granted to receive information and documents necessary for the pilot projects implementation (except for information containing state secrets and other confidential information protected by law), as well as personal information from ministries, departments and organizations; the list of documents necessary for obtaining the relevant permissive documents is reduced by the relevant state body; the fee for obtaining the relevant permissive documents is reduced twofold; a minimum of requirements and conditions for operation is set by the relevant state body.

At the same time, the Regulation enshrines seven reasons for deprivation of the status of a Special Regime participant (e.g., failure to fulfill contractual relations with the working body, recognition of a legal entity bankrupt, provision of unreliable information, non-compliance of the activities of a Special Regime participant with the types of activities specified in the project). This list is not exhaustive, as the legislator leaves also other reasons stipulated by law.

However, this document cannot be called ideal, as it contains a number of provisions that contradict the legislation:

– first, the refusal to register a Special Regime participant in case of taxes and other mandatory payments contradicts the legislation on entrepreneurial activity;

– second, the absence of a final list of reasons for deprivation of the status of a Special Regime participant creates grounds for corruption;

– third, the regime of issuing conclusions on obtaining the status of a Special Regime participant is non-transparent.

2.2. Literature review

In the scientific literature there is no unified approach to the definition of AI. For example, scientists from Uzbekistan S. Gulyamov and I. Rustambekov defined AI as a large area of scientific and applied research[10].

Andreas Kaplan and Michael Haenlein (2019) wrote that artificial intelligence is "a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation".

Elaine Rich and Kevin Knight (1991) define AI as a kind of science that teaches computers to perform functions of humans that give them superiority over them. Ronal Chandra and Yoga Prihastomo (2012) distinguish AI as a type of intelligent software.

An important part of using artificial intelligence is the problem of liability. In this regard, it is interesting to consider the position of an Uzbekistan researcher S. S. Bozarov. He considered approaches to the legal liability of artificial intelligence, like equating the artificial intelligence objects to legal entities or objects of increased public danger, and proposed as a solution the need to establish proprietary (limited) rights to AI[11].

EU researchers comprehensively studied the issues of artificial intelligence application in 3D and 4D cadastres. For example, I. Williamson (1997) substantiated the necessity of transition to 3D cadastre. S. Hendriatiningsihs et al. (2007) proposed a hybrid version of 3D cadastre combining the main provisions of 2D cadastre with 3D modeling. Mohamed El-Mekawy et al. (2014) highlighted the main advantages of 3D cadastre.

A separate issue is the study of legal regulation of the use of 3D cadastre data as an object of artificial intelligence. Given the presence of different practices, there is still no unified approach to this issue.

In particular, one group of scientists proposed to regulate the AI use in the form of a 3D cadastre object concept, a separate regulatory act, or in the form of systematization of norms related to the AI use (Stoter & Zevenbergen, 2001; Karki et al., 2011).

Another group puts forward the idea of restrictive regulation (Sandberg, 2001; Stoter & Ploeger, 2003; Tan & Hussin, 2012). Other scholars considers the legal status of 3D cadastre as a result of interaction between public and private law (Navratil, 2012). Still others adhere to the position of common property law (Paulsson, 2012).

The most prominent proponents of legal regulation of 3D cadastre use – P. Van Oosterom, J. Stoter, H. Ploeger, R. Thompson, and S. Karki – propose to recognize 3D

[10] Gulyamov, S., Rustambekov, I. (2021, March 2). Artificial intelligence – the modern requirement in the development of society and state. Pravda Vostoka, 43(29547).

[11] Bozarov, S. S. (2023). Legal liability in the framework of artificial intelligence: Abstract of Dr. Sci. (Philosophy) thesis. Tashkent: TSUL.

cadastre as an independent right on a par with such rights as to own, use and dispose (Van Oosterom et al., 2011).

Fatih Do¨nera et al. (2011) consider the problems of registration of utilities in the cadastre in four dimensions on the example of legislation of three countries in terms of legal, organizational and technical cadastral requirements, based on a prototype from the Netherlands, and substantiate its prospects.

Peter Van Oosterom and co-authors (2006), justifying the advantages of 4D-cadastre in the Australian and Dutch practice, analyze legal aspects of registration of temporary land titles within the framework of Eigentum, droit de propriété and their security guarantees, as well as the consequences of selling real estate to several persons at the same time, validity of the time scale of a timeshare cadastre object based on the Queensland Code requirements.

The advantages of artificial intelligence over traditional technologies in the field of cadastre do not require proving; they are obvious.

The current stage of economic reforms necessitates the transition to the use of more sophisticated AI systems (e.g. neural networks) in the national cadastre. The reason is that the functioning 2D cadastral model in Uzbekistan does not meet the needs of the digital green economy, which is being formed in the country.

Factors contributing to the use of artificial intelligence in cadastres include:

– modern national cadastres of natural resources are systems of geographic information due to full-fledged application of GIS technologies. An electronic map of land plots has been created on their basis;

– in 2017, Uzbekistan switched to international standards in the field of geodesy – the World Geodetic System (WGS-84), which is an Earth-bound global reference system, including the Earth model, defined by a set of basic and auxiliary parameters. Previously, Uzbekistan used the 1942 Coordinate System (SK-42), inherited from the socialist system of economic management, which allows obtaining data on objects with an error of 2 cm;

– there is an intensive growth of urbanization in the country, including the expansion of urban areas with complex infrastructure, construction of high-rise buildings and underground facilities (tunnels, underground networks and infrastructure facilities), dense developments with complex structures and infill developments. All this happens against the background of limited area of settlements and the growth of demographic processes that strengthen the demand for real estate. In particular, Article 42 of the Housing Code of the Republic of Uzbekistan established the social norm of housing per person not less than 16 square meters, and for wheelchair users – not less than 23 square meters[12]. According to forecasts, the country's population is expected to grow to 40 million by 2030[13], compared

[12] In the nearest years the population of Uzbekistan will reach 40 mln people. (2023, 9 November). Daryo. https://clck.ru/3CsGsn

[13] Tasks for the efficient use of land resources have been identified. (2023, 21 November). Official website of the President of the Republic of Uzbekistan. https://clck.ru/3CsGxD

to the current figure of about 37 million. This means that the need for housing will grow. Therefore, land plots of other categories will be utilized by changing their category, which, in turn, will affect the credibility of the entire land fund.

At the same time, we can identify a number of factors that significantly hinder the implementation of artificial intelligence technologies. Let us dwell upon some of them.

First, the formation of natural resource cadastres is incomplete. For example, in 2023, 460 thousand hectares of land, more than 900 thousand hectares of agricultural land, as well as land along canals and collectors, near natural lakes and rivers, were not included in the cadastre and their legal status was not determined[14]. Taking into account that artificial intelligence can only process the data algorithms that were set by a human, the prepared content will also be incomplete in case of incomplete algorithms. Hence, the result presented by the artificial intelligence will be unreliable. The question arises as to the feasibility of using artificial intelligence under such conditions. That is why the cadastre completeness should be the main condition for the artificial intelligence application.

Second, the old technological base does not meet the needs of the digital economy. While there is a global trend to abandon cadastral mapping, we still use such technologies of cadastral information collection as topographic-geodetic, cartographic, soil science, agrochemical and geobotanical surveys. Uzbekistan still does not have its own space observation satellite, but has to rent foreign ones. Major shifts in this direction started in 2023. In particular, 600 Matrice drones and various software were purchased; funds were allocated to upgrade existing drones; airplanes for aerial surveys were purchased, and the purchase of 80 stations for satellite surveillance is planned for this year. However, this is not enough to form a complete and reliable cadastre.

Third, Uzbekistan did not participate in the Cadastr-2014 project and does not participate in the Cadastr-2034 project, which directly provide for the artificial intelligence application in the form of 3D and 4D cadastre.

Fourth, the mechanism of formation of legal knowledge in the field of artificial intelligence technologies is still unsettled. At present, five higher educational institutions of the country (Tashkent University of Information Technologies named after Muhammad al-Khorazmiy, National University of Uzbekistan named after Mirzo Ulugbek, Tashkent State Technical University named after Islam Karimov, Samarkand State University named after Sharaf Rashidov, and Research Institute for the Development of Digital Technologies and Artificial Intelligence) train specialists in the field of “Artificial Intelligence”. However, training specialists in the field of AI legal regulation has not been considered yet. Tashkent State Law University, the basic educational institution in the field of jurisprudence, is included in the list of universities where disciplines on AI application in public administration are

[14] Decree of the President of the Republic of Uzbekistan No. PP-4996 dated February 17, 2021. https://clck.ru/3CsGzX

taught[15]. However, the training of specialists in the field of legal regulation of AI application is still not been established.

Fifth, the state of scientific activity is unsatisfactory. To date, the country has no scientific research in the field of legal regulation of activities using AI in the cadastral sphere. Today, Uzbekistan does not belong to the countries with a high level of development of artificial intelligence technologies; however, the application of artificial intelligence is quite in demand in the field of cadastre. This, in turn, requires active and in-depth research of legal problems of regulating the AI application in cadastre in parallel with specialist training.

Sixth, the state is rather passive in financing projects in AI application. To date, AI projects financing is carried out mainly by non-state (developer) funds, or by pooling the capital of large state-owned entities with businesses (Alliance).

Seventh, there is a lack of international standards implementation in this sphere. The fundamental UNESCO Recommendations on the Ethical Aspects of Artificial Intelligence, adopted in 2021, has not been implemented yet.

In our opinion, the use of artificial intelligence in the sphere of cadastre will help to solve a number of existing problems.

First, it will help to raise the national cadastre to the international level. In all developed countries, as well as in many developing countries, the cadastre is the main source of information in ensuring the inviolability of private property.

Second, it will increase the prestige of the cadastre as the main reliable legal source to guarantee the right of real estate ownership. In foreign countries the prestige of the cadastre is high due to its reliability and accuracy. This cannot be said about the cadastre in Uzbekistan, which is not fully formed even on the threshold of the second quarter of the 21st century.

Third, it will significantly reduce the level of corruption and the possibility of making "cadastral" errors, because the human factor will be excluded from the formation and provision of cadastral information.

Fourth, it will significantly reduce the time of decision-making. Introduction of AI technologies will allow processing and updating big cadastral data quickly and will high quality. This will make it possible to receive and change information online. In addition, it will help to avoid unjustified costs for inefficient technical means of collecting and processing of cadastral information and will significantly reduce the time for forming the required content.

Thus, the introduction of artificial intelligence in cadastre will contribute to obtaining reliable data and results with complete and reliable information available. This will also contribute to increasing the prestige of cadastre.

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[15] Constitution of the Republic of Uzbekistan. https://clck.ru/3CsH5i

Conclusions

The use of artificial intelligence as the next stage of information automation can be viewed as the future of the entire national cadastral system.

On the agenda in Uzbekistan is the development of the Strategy of Artificial Intelligence Development, which should have been adopted as early as 2022. This act should contain a state program to support scientific research and innovative projects in the field of artificial intelligence, formation of a large amount of digital data in the state language, creation of modern high-tech infrastructure and hardware complexes to solve the problems of artificial intelligence, training of personnel, as well as improving the system of control and risk prevention in the sphere of artificial intelligence.

At the same time, we consider it advisable to include the following issues in this document:

1. Basic theoretical concepts (including the concepts of "artificial intelligence", "artificial intelligence life cycle" and "artificial intelligence developer").

2. Legal status of artificial intelligence. To date, in our opinion, it is too early to speak about artificial intelligence as an independent object or subject of national law. It is reasonable to consider the joint responsibility of the artificial intelligence developer and the algorithms owner.

3. Compulsory licensing of activities with the use of artificial intelligence. Currently, the Coordination Commission[16] gives its opinion on the results of studying the submitted documents of applicants to be IT-park participants.

4. Development of a system of ethical principles of AI application in accordance with international and constitutional norms.

5. Legislative stipulation of a certain limit of obligatory financial state support of AI application in cadastre. Direct financing from the state budget of this sphere, in our opinion, would clearly express the state's interest in the wide application of AI. At present, the state supports this sphere by granting privileges and preferences, free use of buildings, compensation of personnel training costs, etc. The state supports this sphere by granting privileges and preferences, free use of buildings, compensation of personnel training costs, etc.

6. We propose to include Melbourne University (Australia) in the list of foreign research and higher educational institutions in the field of cadastre. This is a world's leading university in studying the legal regulation of 3D, 4D and 5D cadastres.

7. We propose to consider the issue of Uzbekistan joining the global Cadastr-2034 project. This will help to form a systematic approach in the use of AI through the formation of 3D, 4D and 5D cadastres.

[16] Coordination Commission for the implementation of the "Digital Uzbekistan - 2030" strategy, approved by the Decree of the President of the Republic of Uzbekistan No. PF-6079 of October 5, 2020.

Artificial intelligence for the national cadastre is as necessary as air. Currently, we see attempts to adapt the old cadastre to the needs of the new economy – digital green economy, which needs reliable information about the state of natural resources. Reforming the management of the national cadastre, namely, the creation of a special body – the Cadastre Agency, was a turning point for the national cadastre in terms of updating the technological base of this activity. In Uzbekistan, a certain base for application of artificial intelligence has already been formed, which shows in the functioning of geographic information systems, digital electronic maps and systems for cadastre objects assessment. A promising area for the national cadastre is the use of artificial intelligence for registering real estate rights, as well as for document recognition. Nevertheless, the practical application of artificial intelligence in the cadastre is ahead of its legal regulation, which creates ambiguities in recognizing it as an official source of cadastral information.

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Цифровые технологии в национальной кадастровой системе Узбекистана: проблемы правового регулирования

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Ключевые слова

государственный кадастр,
искусственный интеллект,
кадастровая информация,
национальное законодательство,
право,
правовое регулирование,
специальный правовой режим,
Узбекистан,
цифровые технологии,
этика

Аннотация

Цель: проведение критического анализа состояния национального законодательства Узбекистана на предмет правового регулирования цифровизации и использования искусственного интеллекта в кадастровой сфере.

Методы: основу проведенного исследования составляют такие методы научного познания, как формально-юридический и сравнительно-правовой анализ, индукция и дедукция.

Результаты: проанализированы положения, которые регламентируют цифровизацию и применение искусственного интеллекта в кадастровой сфере, выявлены правовые пробелы. Определено, что практическое применение технологий искусственного интеллекта опережает его правовое регулирование. Отмечаются недостатки правового регулирование в указанной сфере (отсутствие легальной дефиниции и определения правового статуса искусственного интеллекта в национальном законодательстве, регламентация участия субъектов предпринимательской деятельности в управлении искусственным интеллектом и др.), что затягивает процесс его полноценного применения и уравнения наряду с традиционными источниками кадастровой информации. Обоснована необходимость всеобщей оцифровки национального кадастра. Спрогнозирована возможность более широкого применения искусственного интеллекта в природно-ресурсной кадастровой системе. Утверждается, что существующая система в ее текущем состоянии в последующем будет приводить к принятию неправильных решений и появлению кадастровых ошибок, в связи с чем необходимо совершенствование правового регулирования в сфере кадастра.

Научная новизна: впервые представлена оценка итогов оцифровки национального кадастра и даны прогнозы о возможности применения искусственного интеллекта в данной сфере при условии дальнейшего совершенствования правового регулирования, которое имеет принципиальное значение для реформирования кадастровой системы, поскольку технологическая основа указанной системы не в полной мере отвечает потребностям цифровой экономики.

Практическая значимость: обусловлена отсутствием правовой регламентации понятия и правового статуса искусственного интеллекта в национальном законодательстве, а также единого подхода к цифровизации кадастровой системы. Современные технологии активно применяются на практике, однако не имеют под собой достаточной правовой основы. Основные выводы, предложения и рекомендации по теме исследования могут служить основой для дальнейшего совершенствования нормативно-правовой базы Узбекистана в части применения технологий искусственного интеллекта.

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