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THE IMPORTANCE OF DIGITAL TECHNOLOGIES IN THE NATIONAL CADASTRE SYSTEM

Annatation. This article examines the process of transitioning modern state cadastral systems from traditional methods to digital approaches. The study analyzes the main directions of state cadastral digitization, including the use of technologies such as geographic information systems (GIS), cloud technologies, artificial intelligence, and blockchain. The article examines the main advantages of digitization (acceleration of processes, reduction of errors, transparency of information) and the challenges encountered (technical infrastructure, data quality, development of the legal framework). It is emphasized that cadastral digitization is not only an important factor in optimizing land resource management, but also an important factor in economic development and attracting investments.

Key words. Cadastre, digitization, public administration, artificial intelligence, GIS, land cadastre, digital economy, database.

Entry. In our republic, certain results are being achieved, along with the implementation of comprehensive measures in the field of cadastre, in particular, in the digitalization of agricultural management, along with the implementation of comprehensive measures in maintaining the land balance and its accounting in the National Geoinformation System.

Currently, the digitization of state cadastres, which are part of the Unified State Cadastre System (USCS), is being carried out at an accelerated pace. This will not only help to abandon traditional paper documents, but also to automate and optimize the entire process of creating, storing, editing and distributing cadastral information, converting data into digital form. This transition will

significantly increase the efficiency, accuracy and transparency of land resource management.

The cadastres, which are part of the USCS, are considered a large database that affects the progress of economic reforms, which further increases the importance of using artificial intelligence (AI) in working with cadastral data.

According to the analysis of the “International Government AI Readiness Index” conducted by Oxford Insights, Uzbekistan is making great efforts to introduce AI technologies. For example, Uzbekistan ranked 95th in 2020, 93rd in 2021, 79th in 2022, 87th in 2023, and 70th in 2024. Thus, the country's position in the use of AI has improved significantly in five years. This is largely due to the use of AI in the cadastral sector.

Based on the Administrative Regulation on State Services for the Provision of Information on the History of Real Estate, a certificate on the history of real estate can be obtained directly at the State Services Center or through the unified interactive state services portal or the davreestr.uz website.

Materials and methods. Modern technological directions of digitization of the USCS system include integration of AI and geographic information systems (GIS) software, creation of an electronic database of cadastral objects, and interfaces and applications that display land monitoring information using the ArcGIS software:

−improvement of the automated system for geovisualization of attributive indicators of land users;

−substantiation of methods for digitizing the analysis of the geodatabase of lands;

−improvement of maintaining the register of addresses included in the land fund based on GAT;

−development of a method for analyzing seasonal USCS data in the geodatabase using a module created in the additional ArcGIS program.

– a method for organizing land accounting in settlements based on geoinformation technologies has been developed and modularized.

The research process consisted of the following stages:

1. Problem identification: limitations of traditional cadastral systems.

2. Data collection: collection of information on scientific articles, developments and practical projects.

3. Analysis: systematic analysis and generalization of the collected data.

4. Conclusion: development of conclusions and proposals based on the results obtained.

Results. The mainstay of the digitization of state cadastres based on GAT. It allows you to link each land plot with its spatial data (coordinates, boundaries) and legal data (owner, type of right, cadastral value). This creates the basis for creating clear and visual cadastral maps, easily updating them, and conducting complex analyses, planning the use of land resources.

Instead of traditional scattered databases, the transition to a single centralized or cloud platform ensures seamless data exchange between all state agencies (tax, judicial, architectural). As a result, the principle of “entering data once, using it many times” is implemented, and time and resources are saved.

AI is important in processing cadastral data. AI algorithms analyze high-resolution aerial photographs and satellite images to automatically determine the boundaries of land plots, identify buildings, and detect illegal construction. This reduces human error and makes monitoring more efficient.

Blockchain technology allows for the immutability and transparency of cadastral records. Each property registration transaction is recorded as a block on the blockchain, which prevents legal problems such as fraud and the sale of the same property to multiple people. This significantly increases citizens' trust in the state system.

The digital cadastre system will enable online services for citizens and businesses, such as property registration, obtaining cadastral certificates, paying

taxes, and submitting applications online. This will streamline bureaucratic processes and facilitate access to government services.

Discussion. The use of artificial intelligence in the digitization of state cadastral systems will help solve a number of existing problems.

Firstly, it will help to raise the national cadastre to an 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.

Secondly, it will increase the authority of the cadastre as the main reliable legal source of guaranteeing ownership of real estate.

Thirdly, it will significantly reduce the level of corruption and the possibility of making "cadastral" errors, since the human factor in the formation and submission of cadastral data is excluded.

Fourthly, it will significantly reduce the time for decision-making. The introduction of AI technologies will allow for quick and high-quality processing and updating of large amounts of cadastral data. This will allow for online receipt and modification of information. In addition, it will help to avoid unreasonable costs for inefficient technical means of collecting and processing cadastral data and significantly reduce the time for forming the necessary content.

Thus, the introduction of artificial intelligence in the cadastre will help to obtain reliable information and results with complete and reliable data. This will also serve to increase the prestige of the cadastre.

Conclusion. In conclusion, the digitization of state cadastral systems is not only a technological upgrade, but also a strategic development task. It will increase the transparency of the land market, attract investment and contribute to sustainable economic growth. For successful implementation, high-level political will of the state, a phased approach and the involvement of all segments of society are essential.

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