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Introduction to GIS Application in the Land Cadastre

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Abstract: This article addresses the problems with maintaining a land cadastre related to the processing of data on cadastre objects and discusses the current state of GIS technology. The fundamental tenets of contemporary GIS technology in land cadastre management are presented. The contemporary system of land use is categorized. Consideration is given to creative schemes for keeping the state land cadastre up to date.

Keywords: Geographic Information Systems, Land Cadastre, CAD, Microcialion, AutoCAD MAP, OLE (Object Linking and Embending), Photomod, and GeoDraw/GeoGraph.

Introduction. The nation's efficient use processes are intrinsically related to the nation's land management processes. This calls for accurate and current data on the health of the land fund and the dynamics of its growth.

Because there are so many items and themes related to land relations, the country's current system of land use is defined by a lot of information. Therefore, automated systems are the only ones capable of storing, analyzing, and disseminating this complex, multidimensional information.

Geographic information systems (GIS) and land information systems (LIS), which differ in terms of legal support, tasks, principles, content, and categorization features, are the two main areas into which these systems fall.

Various issues in the area of land relations are resolved at all administrative and territorial levels by the State Land Cadastre (SLC), a sophisticated land information system (country, region, territory, region, municipality). Only current computer systems and information technologies are capable of processing the enormous volumes of data related to each land cadastral plot, contour of land, economic and administrative unit, and their dynamics. [2]

Geoinformation systems. Each year, a person's information needs impact all new facets of his activity. Practically all contemporary fields of knowledge have amassed a lot of experience using knowledge obtained from many sources.

The State Land Cadastre and land management are two sectors where a substantial portion of the information changes quickly over time, making it increasingly challenging to use it in traditional paper form for management choices. Only an automated system can ensure the relevance and timeliness of information retrieval. As a result, an automated system with several visual and thematic databases and connections to model calculation functions had to be developed in order to transform data into geographical information and facilitate management choices.

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The governing structures can make wise judgments on the management of the territory by using cartographic data to examine the geographic location of a large number of real estate items as well as their quantitative and qualitative qualities. Specialists who evaluate and forecast the situation of any human activity, such as product marketplaces, territory pollution, etc., require cartographic data. [3]

In most circumstances, cartographic materials allow for the identification of key locations and speedy decision-making to remove the conditions that may otherwise give rise to harmful processes.

The following groups of people might use geoinformation:

- administrative and executive authority structures;
- planning authorities;
- tax inspections;
- real estate authorities;
- legal and law enforcement agencies;
- architectural and planning services;
- operating organizations (communication, transport, buildings and structures);
- research and design institutes;
- construction organizations;
- trade organizations, exchanges of all purposes;
- inspections and control bodies of socio-economic and technical supervision;
- foreign partners and investors;
- commercial formations.
- entrepreneurs,
- private persons.

GIS is a digital model of a real spatial object of the area in vector, raster and other forms.

The collection, system processing, modeling, and analysis of geographical data, as well as their display and usage in the planning and making of management choices, are all GIS functions.

GIS are made to produce maps depending on the data collected at a certain moment.

It is an organized collection of technology, software, geographic data, and humans, according to the Institute for Environmental Systems Studies (GIS developer ARC/INFO). developed to efficiently input, update, process, analyze, and visualize any types of geo-referenced data. [1]

The use of modern technologies in the conduct of the land cadastre. It is expensive and time-consuming to create new land cadastre software. Unavoidably, the program will have components that are duplicates of GIS that currently exist. According to a review of contemporary GIS systems, there are three categories that apply to both Russian and international GIS systems.:

- the majority of the software tools now in use throughout the world's most popular geographic information systems (Arcinfo, Inicrgraf Mapinfo SPANS CIS, etc.);
- systems utilizing the newest information and computer technology developments (SmallWorld, SICAD, Open, etc.);

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- Domestic GIS are often inferior to top Western GIS and not all of them can be considered full-fledged software packages. The systems that have already gained extensive use both in Russia and abroad are Panorama, Fotomod, and GeoDraw/GeoGraph.

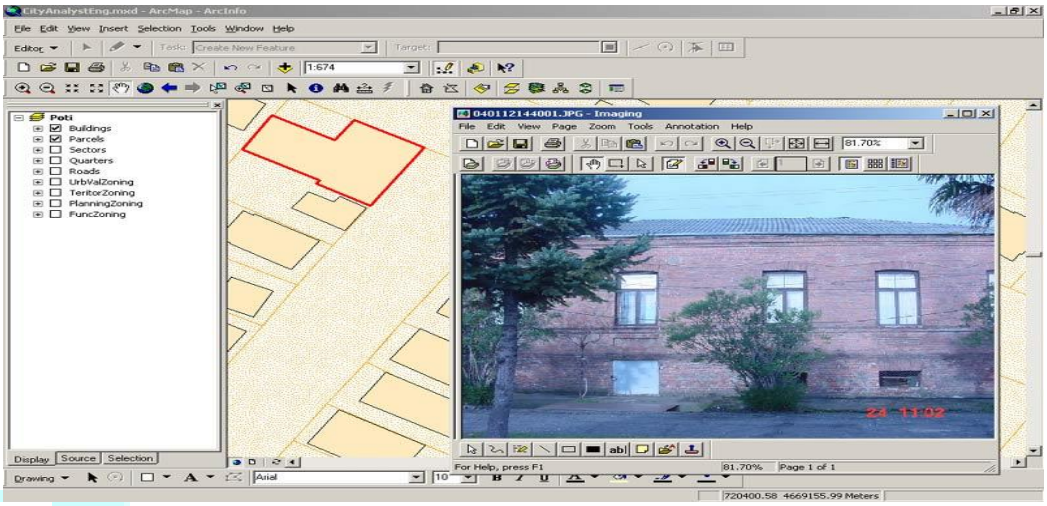

Fig.2. Application of the program in the field of cadastre

We were able to get the following findings after doing an investigation of the GIS software's overall condition.

Foreign GIS software products that don't properly take into consideration the unique characteristics of Russian digital spatial data now dominate the home market.

[6]

The percentage of GIS jobs involving the operational processing of spatial data based on thematic mapping and remote sensing is rising. Semi-functional software gradually gains market share due to the availability of modules for processing vector information and support for relational databases of factual data.

Some providers of raster GIS have developed real-time 3D spatial data display modules thanks to the usage of quick raster data processing methods. In actuality, this signifies the start of the genuine usage of multimedia systems in GIS technology.

Through the development of automated cadastre systems based on relational DBMS, which have grown to be extremely popular, attempts have also been made to automate the process of land registration with the introduction of computer technology. These systems store data as a collection of relational databases that contain details on real estate, its owners, and occasionally its location. The majority of the time, no spatial references to objects are made while storing information.

The application of geoinformation technology was the next breakthrough in land cadastre systems. It gave rise to the opportunity to establish and maintain a cadastre at a qualitatively new level by immediately producing maps in digital form in accordance with coordinates obtained from measurements made on the ground or while processing data from remote sensing techniques. The ability to store cadastral data electronically allowed for the transition to a paperless office environment and a more sophisticated land registration system.

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The automated land cadastre system is often constructed using a local network as its foundation. The system develops automated workstations that are proficient in different phases of information processing, such as APM registration of applications, APM maintenance of the official cadastral map, APM at the request of the land user base, APM processing of cadastral survey data, etc.

Different technical methods may be used to implement land cadastral systems and other specialized systems. You have three options for building your system: from scratch, using pre-made software, or building on top of one of the general or niche CAD systems. [7]

Each of these choices has benefits and drawbacks of its own.

Since third-party solutions frequently cannot ensure compliance with established standards, such as cartographic requirements for the compilation of technical documentation, the construction of the system from "scratch" allows you to fully fulfill all of the end users' expectations. Furthermore, such systems are pricey goods. In certain areas, the choice was taken to create their own GIS for the land cadastre.

The Albeya system is a prime illustration of such a resolution. The land cadastre system LasGraph, produced by the Omsk business Hit-Soft in 1993; the software suite for preserving the land cadastre "Earth," established by the NPF "Karina," etc., were all developed and utilized in Ufa.

Utilizing OLE (Object Linking and Embending) technology, which is used to variable degrees in numerous programs, including many CAD systems, is another approach to design your own customized system. Active x-components made specifically to work with vector (including cartographic) data are also an option. With this method, you can quickly develop the appropriate land information system.

The following universal CAD systems are used to generate a GIS:

- Microcialion's internal programming languages, which resemble C and BASIC, support OLE, and may be used to construct Java applications;
- A multitude of modules that provide cartographic features and modules for cadastre have been developed by both Ziegler Informatics and Russian developers; CADdy contains an internal C-like language for programming;
- GIS and AutoCAD Extension A full range of features are available in AutoCAD MAP to let you build your own own geographic information system. Additionally, AutoCAD and its GIS—the AutoCAD MAP extension—support OLE technology and have a rich range of features, including those for designing cartographic applications.

The development of a GIS based on the systems mentioned above (AutoCAD, Microcialion, CADdy) is complicated by one flaw. Since these systems were initially created to produce technical drawings, they include many features that are not required for cartography, such as the ability to generate and edit three-dimensional objects and the inability to deal with topological data. For instance, the absence of polyline and polygon objects in CADdy makes it challenging to analyze spatial objects afterwards.

These systems' emphasis on producing technical drawings has an impact on the idea of layers as well. For instance, the fundamental features of restricting access to layers are not implemented, and the coordinate systems used in cartography are not supported. The data formats used to save drawings are impacted by this technological focus. [4]

Conclusion

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In many instances, it is vital to employ GIS in the cadastral flow because it affects how spatial data analysis behaves, forecasts events and processes, tracks dynamic changes in the borders of accounting items, etc. All of this is predicated on an unbreakable connection between the upkeep of cadastres (registers) of diverse directions using GIS. [five]

Innovative information systems have transformed the way they function and how they employ GIS technology throughout time, simplifying their tasks.

Since third-party solutions frequently fall short of meeting defined requirements, the state geographic information systems of the land cadastre can completely serve all user demands.

References:

1. Кольцов А.С. Геоинформационные системы: учеб. пособие /А.С. Кольцов, Е.Д. Федорков. Воронеж: ГОУВПО «Воронежский государственный технический университет», 2006. 203 с.
2. Капралов Е.Г., Кошкарев А.В., Тикунов В.С. и др. Основы геоинформатики. Книга 2. Учебное пособие / М: “Академия”, 2004 (стр. 372-380).
3. Мазуркин П.М. Геоэкология: Закономерности современного естевострознания: научное изд./П.М. Мазуркин Йошкар Ола : МарГТУ, 2006.-336 с
4. Скворцов А.В. Геоинформатика: учебное пособие 2006.
5. Турлапов В.Е. Геоинформационные системы в экономике: Учебно- методическое пособие. - Нижний Новгород: НФ ГУ-ВШЭ, 2007.
6. Фадеев А.Н. Применение ГИС «карта 2003» в лесном хозяйстве / А.Н Фадеев, О.А. Зимина // Геопрофи. 2006. №6 С.2526
7. Фадеев А.Н. Актуализация природных объектов в ГИС/ А.Н Фадеев, О.А. Зимина // Пенза: 2006. С. 236-238.