International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

COPY RIGHT

IJIEMR Transactions, online available on 10 th Nov 2021.
Link: https://ijiemr.org/downloads/Volume-10/ISSUE-11
DOI: 10.48047/IJIEMR/V10/I11/03

Title: **USE OF MODERN GEO-INFORMATION SYSTEMS IN LAND CADASTRE MANAGEMENT**

Volume 10, Issue 11, Pages: 14-17
Paper Authors: **Bakhrinova M.Kh**

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

USE OF MODERN GEO-INFORMATION SYSTEMS IN LAND CADASTRE MANAGEMENT

Bakhrinova M.Kh
Samarkand State Institute of Architecture and Civil Engineering named after Mirzo Ulugbek. Samarkand. Uzbekistan.
bakhrinova.mokhigul@mail.ru

ABSTRACT: This article examines current GIS technology and analyzes land registry difficulties relating to the processing of data on registry objects. The most important elements of contemporary GIS technology in land registry management are outlined. There is a classification of the present land use system. Innovative programs for maintaining the state land registry are investigated.

KEYWORD: Geo-information systems, land registry, CAD, Microcialion, AutoCAD MAP, OLE (Object Linking and Embending), Photomod, and GeoDraw/GeoGraph.

Introduction

The processes of land management and effective utilization are intricately intertwined in any country. This necessitates accurate and up-to-date information on the state and dynamics of the land fund.

Due to the vast number of objects and subjects of land interactions, the modern land use system in the country is characterized by large volumes of information. As a result, only automated systems are capable of storing, processing, and delivering this complex, multidimensional data.

Geographic Information Systems (GIS) and Land Information Systems (LIS) are two significant groupings of systems that differ in terms of their legal structure, purpose, concepts, content, and categorization attributes.

The State Land Cadastre (SLC) is a large-scale land information system that handles a wide range of responsibilities in the field of land relations at all levels of government (country, region, territory, region, municipality). Only contemporary computer systems and information technology are capable of handling massive amounts of data regarding each land parcel, land contour, economic and administrative unit, and their dynamics[2].

Geoinformation systems. Humans' information needs are affecting more and more aspects of their activity with each passing year. Almost every modern discipline of knowledge has amassed a wealth of experience in combining data from many sources.

Fig.1. General geodata of GIS technologies.

Most of the information changes fast over time, making it increasingly impossible to use it in traditional paper form for management decision-making, particularly in the domain of land management and the State Land Cadastre. Only an automated system can ensure that data is received in a timely and accurate manner. As a result, an automated system with a large number of graphical and thematic databases, as well as

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

model calculation algorithms to convert data into spatial information and subsequent management decisions, became necessary.

The capacity to use mapping data to analyze the geographic position of a large number of properties as well as their quantitative and qualitative qualities allows management structures to make educated territorial management decisions. Specialists who assess and forecast any aspect of human activity, such as product marketplaces, pollution, and so on, require mapping data. [3]

In most circumstances, mapping enables for the identification of crucial areas as well as quick decision-making to eliminate the conditions that allow negative processes to occur.

The regulatory and executive arms of government are potential geo-information consumers:

- planning authorities;
- tax inspectorates;
- real estate authorities;
- legal and law enforcement authorities;
- planning services;
- operators (communications, transport, buildings and facilities);
- research and design institutes;
- construction companies;
- trading organisations, exchanges for all purposes;
- inspections and control bodies for socio-economic and technical supervision;
- foreign partners and investors;
- commercial entities.
- entrepreneurs,
- private individuals.
- the GIS is a digital model of a real-world spatial object in vector, raster and other forms.

A GIS's functions include gathering, methodically processing, modeling, and analyzing spatial data, displaying it, and using it to make and resolve management choices.

GIS is used to create maps based on data collected at a specific point in time.

It is an organized set of hardware, software, geographic data, and personnel designed to efficiently input, store, update, process, analyze, and visualize all types of geographically referenced information, according to the Institute for Systematic Environmental Research (the developer of ARC/INFO GIS).[1]

The use of modern technology in the maintenance of the land registry. New land register software is costly and time-consuming to design. Duplication of existing GIS will unavoidably be present in the software. Modern GIS systems can be categorized into three classes, according on an analysis of systems used in Russia and abroad:

- The most common geo-information systems, which make up the majority of existing software tools around the world (Arcinfo, Inicrgraf Mapinfo SPANS CIS, etc.) SmallWorld, SICAD, Open, and other systems using cutting-edge information and computer technologies;
- Domestic GIS systems, which not only lag behind leading Western systems in most parameters, and not all can be characterised as complete software products. The exceptions are Panorama, Photomod and GeoDraw/GeoGraph, which are already widespread not only in Russia, but also abroad.

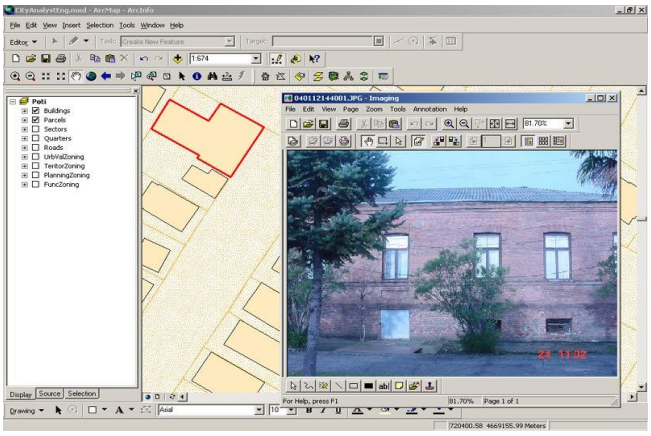

Fig.2. Application of the programme in the cadastre field

An analysis of the overall state of GIS software tools has led to the following conclusions..

The domestic market is dominated to a greater extent by foreign GIS software tools that do not actually take into account Russian specifics of digital spatial data.[6]

In GIS, the share of tasks related to the operational processing of spatial information based on remote sensing and thematic mapping systems is increasing. The availability of vector data processing modules, support for relational factual databases, leads to a gradual increase in the market share of semi-functional software tools.

The use of fast raster data processing algorithms has enabled some raster GIS vendors to create real-time visualization modules for 3D spatial data. In practice, this means the beginning of the real use of multimedia systems in GIS-technology.

With the advent of computer technology, attempts have also begun to automate the land records process by creating automated cadastral systems based on relational DBMS, which have become quite widespread. In such systems, data is stored as a set of relational databases with information about properties and their owners, and sometimes also about the location of the property. All information is generally stored without spatial reference to objects.

The next step in the development of land registry systems was the application of geo-information technology. The new system is based on the use of the data obtained from measurements in the field or by processing remote sensing data to create and maintain the cadastre in a completely new way, creating maps directly in digital form. Storing cadastral information electronically has enabled a move towards a paperless, more advanced land registration system..

In most cases, an automated land registry system is based on a local network. The system creates automated workstations specialized in different stages of information processing, such as; APM for registration of applications; APM for maintenance of the cadastral map on duty; APM for maintaining the land user database; APM for processing of cadastral survey results, etc.

The implementation of land registry systems, as well as other specialized systems, can be based on different technical solutions. You can start building your system from scratch, you can use pre-designed software or you can develop it using one of the universal or specialized CAD systems.[7]

Each of these options has advantages and disadvantages.

Implementing a system from scratch enables all end-user requirements to be met, as often third-party products cannot meet established standards, e.g. mapping standards for the preparation of technical documentation, and are expensive to produce. In some regions, decisions have been made to develop the GIS land registry in-house.

An example of such a solution is the Albea system. The land cadastre system LasGraph, developed by the Omsk company Hit-Soft in 1993; the land cadastre software system Land, created by the Karina non-profit partnership, etc.

Another way to create your own customized system is to use OLE (Object Linking and Embending) technology, which is implemented in varying degrees of detail in many packages, including many CAD systems. It is also possible to use Active x components designed to manipulate vector (including map) data. This approach makes it possible to create the necessary land information system in a short period of time.

The following universal CAD systems are used to create the GIS:

- Microcialion has its own internal C-like and BASIC-like programming languages, OLE support and the ability to create applications in JAVA as well;

- CADdy has an internal C-like language for programming CADdy has also been developed by Ziegler Informatics and Russian developers with many modules for mapping functions and modules for cadastre management;
- AutoCAD and its GIS-extension AutoCAD MAP has a complete feature set for creating your own custom geographic information system. And AutoCAD and its GIS-extension AutoCAD MAP also support OLE-technology and contain a dense set of functions, including mapping, to create an OLE-application.

The above systems (AutoCAD, Microcialion, CADdy) have one disadvantage that makes it difficult to create a GIS based on them. These systems were originally designed to produce technical drawings, so they contain many functions that are unnecessary in mapping, such as editing three-dimensional objects, and do not support working with topological data. For instance, objects of the polyline and polygon types are not available in CADdy, which makes subsequent analysis of spatial objects difficult.

The focus on technical drawings in these systems also affects the concept of layers, e.g. they do not have basic layer access control functions and do not support cartographic coordinate systems. This technical orientation has an impact on the data formats used to store drawings.[4]

Conclusion

The use of GIS in the cadastral flow is necessary in many cases, as it facilitates spatial analysis of data, prediction of phenomena and processes, tracking of dynamic changes in the boundaries of the objects of record, etc. All this implies an inseparable link between the maintenance of cadastres (registers) of various orientations through geo-information systems. [5]

Over the years, innovative information systems have changed the way they work and the application of GIS technology to all areas has made their work easier.

The state land registry geo-information system allows all end-user needs to be fully met, as often third-party products cannot ensure compliance with established standards.

References:

1. Koltsov A.S. Geoinformation systems: textbook / A.S. Koltsov, E.D. Fedorkov. Voronezh: SEIHPE "Voronezh State Technical University"», 2006. p.203.
2. Kapralov E.G., Koshkarev A.V., Tikunov V.S. et al. Fundamentals of Geoinformatics. Book 2. Textbook / M: “Academy”, 2004 (p. 372-380).
3. Mazurkin P.M. Geo-ecology: Laws of Modern Natural Science: A Scientific Edition/P.M. Mazurkin Yoshkar Ola: Volga State University of Technology, 2006.-p. 336
4. Skvortsov A.V. Geoinformatics: Textbook 2006.
5. Turlapov V.E. Geoinformation systems in economy: Textbook. - Nizhny Novgorod:HSE university, 2007.
6. Fadeev A.N. Application of GIS "map 2003" in forestry/A.N. Fadeev, O.A. Zimina//. Geoprohy 2006. №6 P.2526
7. Fadeev A.N. Actualisation of natural objects in GIS / A.N. Fadeev, O.A. Zimina // Penza: 2006. p. 236-238.

.