

**THE ADVANTAGES OF APPLYING GIS TECHNOLOGIES IN TEACHING  
CADASTRAL WORK**

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**Abstract:** This article provides a comprehensive analysis of the advantages of using GIS (Geographic Information Systems) technologies in teaching cadastral work. GIS technologies facilitate the visualization of data related to land plots, property ownership, and land resources, as well as simplify spatial analysis and management. Additionally, GIS systems enable faster and more accurate execution of territorial planning, land resource assessment, monitoring, and control processes.

**Keywords:** cadastre, GIS (Geographic Information System), land plots, visualization, monitoring, territorial planning, geostatistics, practical skills

**Introduction**

The cadastre system is a key tool for managing and controlling information about land plots, property rights, and land resources. Traditionally, data is collected manually, maps are drawn by hand, and calculations are performed manually, which is time-consuming, prone to errors, and reduces efficiency.

In recent years, GIS technologies have been widely applied as an effective tool in cadastral work. Through GIS, land plots can be managed in layers, spatial analysis can be performed, decisions can be made quickly, and resources can be saved. Teaching GIS technologies provides students with both theoretical knowledge and practical skills, improving the quality of cadastral work.

**Main Body**

GIS (Geographic Information System) is an information system used to collect, store, analyze, visualize, and manage geographic data.

- GIS manages data linked to geographic coordinates.
- Data is stored in layers, with each layer having its own attributes.

**Key Components of GIS Technologies:**

1. Database: Attribute information about spatial objects (e.g., land area, owners, type of construction).
2. Geographic Data: Maps, satellite images, drone images.
3. Analytical Tools: Analysis of distance, area, zonal distribution, geostatistics.
4. Visualization Tools: Interactive maps, charts, graphics.
5. Interface and User Modules: Users input data, perform analysis, and view results.

**Advantages of GIS Technologies in Cadastral Work:**

## Data Visualization

- GIS allows visualization of land plots, buildings, roads, and infrastructure in layers.
- Visualization enables complex spatial analyses to be performed clearly and understandably.

## Fast and Accurate Data Analysis

- GIS provides rapid analysis of spatial maps, land area calculations, values, and usage types.
- Geostatistical methods make it easy to identify spatial differences and evaluate areas zonally.

## Integration of Cadastral Data

- GIS integrates with other systems, such as taxation, urban planning, transport, and land resource databases.
- This enhances efficiency in territorial planning and decision-making.

## Accelerated Decision-Making

- GIS outputs allow quick decisions regarding land allocation, tax rates, and property valuation.
- Decision-makers rely on real-time, updated information.

## Resource Saving and Increased Efficiency

- Reduces time and labor compared to manual mapping and calculations.
- Automated data updates and synchronization improve cadastral workflow efficiency.

## Remote Monitoring and Updates

- Satellite and drone imagery allow remote monitoring of areas.
- GIS helps quickly detect illegal constructions and changes in land plots.

## Application of GIS in the Educational Process:

1. Practical Exercises: Students perform mapping of land plots, area calculations, and analyses in GIS software.
2. Simulation: Modeling regions using real cadastral data and identifying problematic zones.
3. Interactive Learning: Creating interactive maps, simulating decision-making, and engaging students in the learning process.
4. Analytical Skills: Preparing spatial analyses and statistical results in reports, charts, and graphics.

## Example:

Using GIS to study a district's land cadastre:

- Land plot layers: ownership, usage type, area, value.
- Spatial analysis: residential, industrial, and agricultural zones.
- Monitoring: detecting illegal constructions and regional changes.

This example demonstrates how GIS technologies provide fast and reliable results in cadastral work.

## Conclusion

GIS technologies enhance efficiency in cadastral work, enable rapid data analysis, and simplify decision-making. Teaching GIS technologies equips students with both theoretical knowledge and practical skills, significantly improving the quality and effectiveness of cadastral work and ensuring more accurate and reliable land resource management.

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