Nominal assets valuation by GIS

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ABSTRACT

The change from paper maps to digital data, in various kinds of geographical data analysis and applications, has made easier to use identical spatial data for different applications and also for combining several information layers into complex spatial models. In the recent years, the usage of geographical informational systems have been rapidly increased and it became an essential tools not only in assisting daily work but as a decision support tool especially for planning, resource management and in economic informatics field. In this paper, we are analyzing the possibility of using GIS in nominal asset land valuation.

INTRODUCTION

Land valuation is the process of assessing the characteristics of a given piece of land. The process may be described as a carefully considered estimation of the worth of the land or property based on experience and judgment. However, the objective of land valuation is to determine the value; but the value of a land is given by the capacity of transferring it to money or equivalent. The ability of being transferred is not creating a value but it represents the most essential characteristic of a value.

In the land valuation, the value and potential of a property are fundamentally determined by the location. As any spatial object and spatial related element, geographical information system can be used in decision making related the land valuation. A sufficient estimation can be done by analyzing a certain amount of land characteristics in an objective way, with the assistance of Geographical Informational Systems. GIS for cadastre management can by extension through technology and database management to compute land assents valuation.

ASSET VALUATION METHODS

The use a particular property valuation technique is dependent on property type and of the purpose of the valuation. There are three main evaluation methods:

- **Comparative Method -** assumes that the market value is equal to the price recently paid for a similar property or interested in asset. The problem is to determine what the market considers to be recent and similar.
- **Income Method -** is also a comparative method and holds that the market value of an interest in asset is equal to the present value of the net income (the gross income less the cost of overheads) that should in future come from the asset.
- **Cost Method -** also known as the contractor's method or the quantity survey approach. It assumes that the costs of replacement, less appropriate depreciation, are equal to the value.

THE PROPERTY VALUATION SYSTEM

Real-estate market values vary to a yet greater extent according to the type functional zones, its neighborhood, location of the plot in relation to the city, utilities in the area (water, central heating, gas, etc.), complementary services (health, education, leisure, commercial areas so on), and criminality of the area or eventual environmental problems.
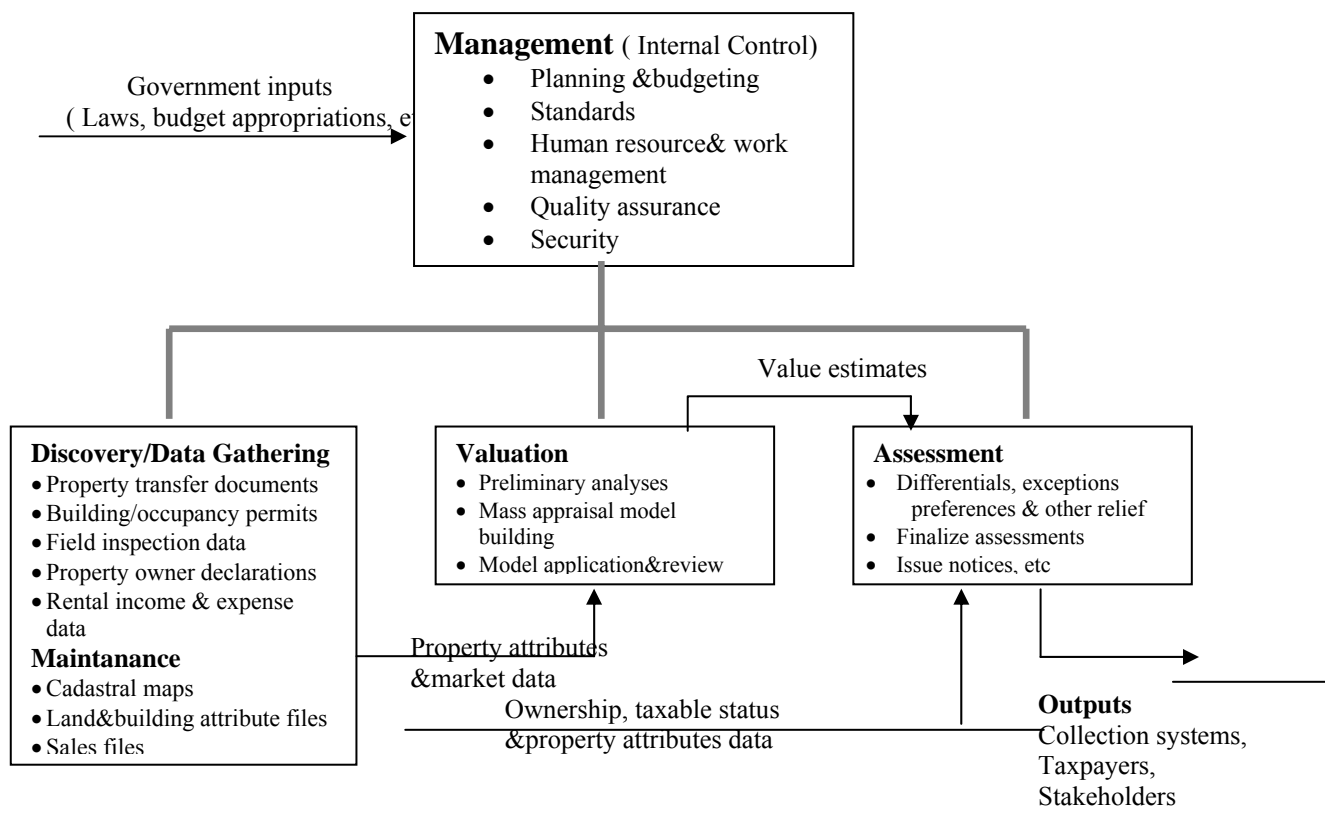

Figure 1 - Real Property Assessment System

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The land property assessment systems, main function is to determine a quantitative and qualitative valuation of the property and estimate a market value for Figure 1 depicts the management, data gathering and maintenance, market analysis and valuation, and assessment functions of a real property assessment system. Administration of the valuation program must be economical. Standardized procedures, quality control measures, effective public information programs, and attention to uniformity help achieve these goals.

Property valuation depends on data that are relevant, accurate, timely, and economical to maintain. Relevant data reflect what makes a property desirable or undesirable in the marketplace, are necessary to the valuation methods. The totality of maps and files containing data related to property valuation and property taxation constitutes a "fiscal cadastre." Building and maintaining the property inventory and attribute database are the most labor-intensive and, hence, most expensive aspects of property valuation and property tax administration.

Consequently, these activities should be well designed and managed. Data management responsibilities encompass the determination of data needs, collection methods, and data storage and retrieval facilities. Work (or "business") processes related to building and maintaining the real property database includes:

- *Compilation of cadastral maps and assignment of parcel identifiers.* Newly compiled maps should be digital, as they are a major component of a geographic information system (GIS). A complete and up-to-date set of cadastral maps provides the most effective way to inventory real property holdings. The maps help ensure that the property tax administration has accounted for all land and that no land areas are taxed twice. The maps also detail the location, shape, and size of every parcel of land, as they are important determinants of land value. As is planned, building records should be keyed to land parcel records. Although survey descriptions and addresses identify land parcels, parcel (cadastral) numbers provide a compact and uniform code for identifying land parcels in property tax and cadastral records. A cadastral number should uniquely identify a single parcel configuration. Whenever a parcel is divided or combined with another parcel, the original parcel identifier should not be used to describe the succeeding parcel or parcels. A new identifier or identifiers should be assigned and the prior identifiers retired. Alternatively, suffixes can be assigned to a "parent" identifier to indicate a change. Whenever parcel identifiers are not unique, market analyses may be confounded and tax liabilities confused.
- *Maintenance of land and building attribute records.*
- *Maintenance of sales records and other evidence of market values.*
- *Maintenance of records of owners, taxes assessed, and tax payments.* The fiscal cadastre also must contain current data on the persons liable for paying property taxes, the types (classes) of property that must be assessed, and the circumstances that make persons and properties eligible for exemptions from taxation and for other forms of property tax relief.

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USING GIS IN LAND VALUATION PROCESS

The value of property reflects its capacity to fulfill a function. With regard to commercial property, functional qualities may include:

1. Location influences (accessibility to the market place or commercial area, accessibility to leisure, health and education, proximity to suppliers of raw materials and important nodes such as railway stations, car parks and open spaces,)
2. Physical attributes (size, shape, age and condition)
3. Legal factors (lease terms and restrictive covenants)
4. Planning and economic factors (planning constraints, permitted use and potential for change of use).

As we can notice all these factors are included in a GIS based cadastre system. In the following we preset an analysis of each factor which influences the value of the land in the city of Oradea:
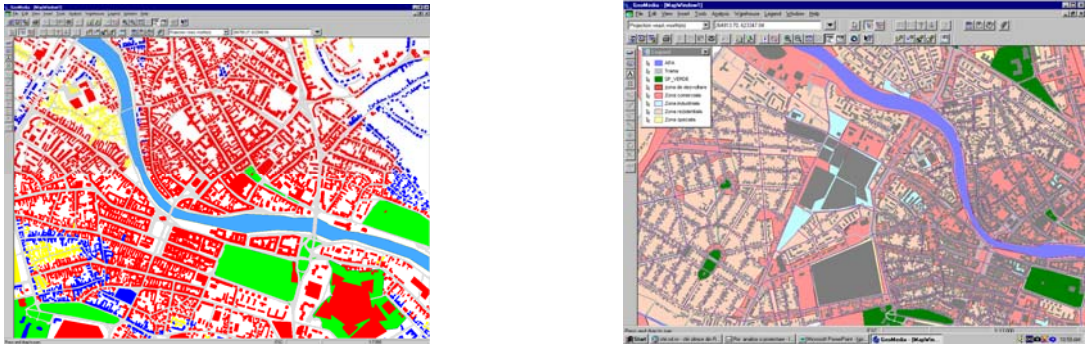
- Fiscal zoning and functional zoning

Figure 2 - Fiscal Zoning and functional zoning
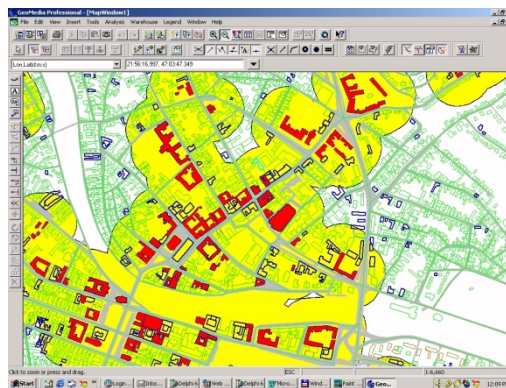
- Architecture monuments and their protection area

Figure 3 - Restriction areas surrounding monuments
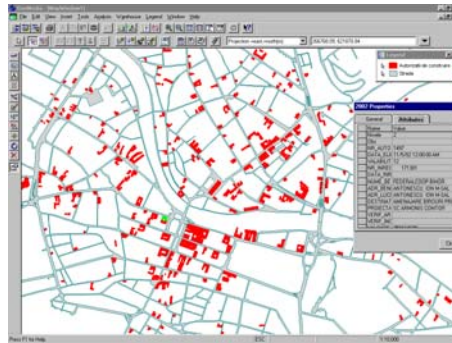
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- **Building permits**

Figure 4 Building permits
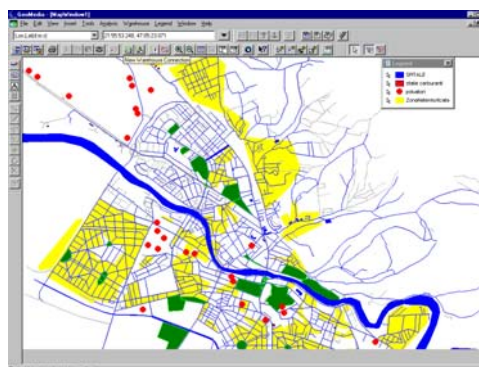
- **Environmental pollution**

Figure 5 Pollution

CONCLUSIONS

As presented in this paper an adequate estimation of the value of a land can be done by analyzing a certain amount of land characteristics in an objective way, with the assistance of Geographical Informational Systems. GIS for cadastre management can by extension through technology and database management to compute land assents valuation. Using the GIS to compute the information already existing in local, regional or national data banks an evaluator can estimate and explain more accurately how the value of a property is created and which factors directly or indirectly influence it.

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