

## A DATABASE MANAGEMENT SYSTEM IN REAL ESTATE ASSESSMENT

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**Abstract:** *The paper presents a database management system created for real estate assessment. The proposed database contains data taken from the real estate market, the characteristics of the traded real estate properties, their trading prices. It also contains property-specific data, with depersonalized information. The database management system was created using the Geographic Information System (GIS), offers information on traded or assessed real estate properties, leading to a better use of resources, can contribute to the creation of a real database needed for assessing real estate properties and can also help the assessor establish a reasonable market value of the property.*

**Keywords:** *database management system; real estate;*

### 1. Introduction

The economic development, changes in the companies and world economy, growth of inter-regional trade and investments, cultural changes, lead to the globalisation of the economy, politics and culture. A major aspect of the globalisation is also the evolution of electronics, telecommunications and computer science with profound implications on the dynamics of the economy and society. These allowed the development of computerised mapping and database management systems, thus contributing to the development of Geographic Information Systems (GIS). This system allows access to huge data volumes, forms connections between different data sets and analyses the connections between them.

GIS represents an information system for the mapping and analyse of objects and events occurring on Earth, integrates database operations such as interrogations and statistical analyses, with the advantage of unique visualisations and geographical analyses offered by maps. GIS is a framework for gathering, managing, and analyzing data. [1]

The market of real estate assessment services is also influenced by these tools and looks for new means of using them in the assessment process.

In the real estate assessment activity, it is necessary to use a database management system, which makes this activity more efficient and economic.

### 2. The architecture of the database management system

The database management systems have an important role in the evaluation of necessities, in defining the priorities and making the activities efficient, their consolidation leading to the improvement of the activity performance.

A database represents a means for storing certain information and data on external support (storage device), with the possibility of their quick retrieval. [2]

The system is based on assumptions connected to the environment in which the system will be operational and aspects regarding the construction of certain characteristics for

the system. The objectives of defining the architecture specific to the system are the following: making sure that the assumptions and the customisation are correct and correspond to the expectations and provision of a stable base for the system, able to function and which is practical. The systems may be regarded from three perspectives:

- constructive - the system is built from several subsystems, which in their turn are built from other subsystems and/or components;
- functional - a system can fulfil one or more specific functions, according to the set of objectives it has;
- behavioural - a system can execute the functions and interacts with the environment.

The framework architecture expresses a system in several manners:

- functional- functional architecture represents the functionality the system needs to meet the necessities of the users;
- physical- physical architecture highlights how the functionality may be implemented as applications, to meet the needs of the users.
- in terms of communications - communication architecture represents the connection allowing the data transfer between the systems in the physical architecture and between these systems and the outside world.

A system architecture represents only a description of how the system components interact to meet the objectives of the system. It performs three main objectives:

- defines the functioning manner of the entire system;
- defines what each component is doing;
- defines which information is transmitted between the components. [3][4]

The proposed database management system uses to transmit the necessary services to the users, an information chain containing the data acquisition, data processing and distribution of information to system users, (Fig.1).

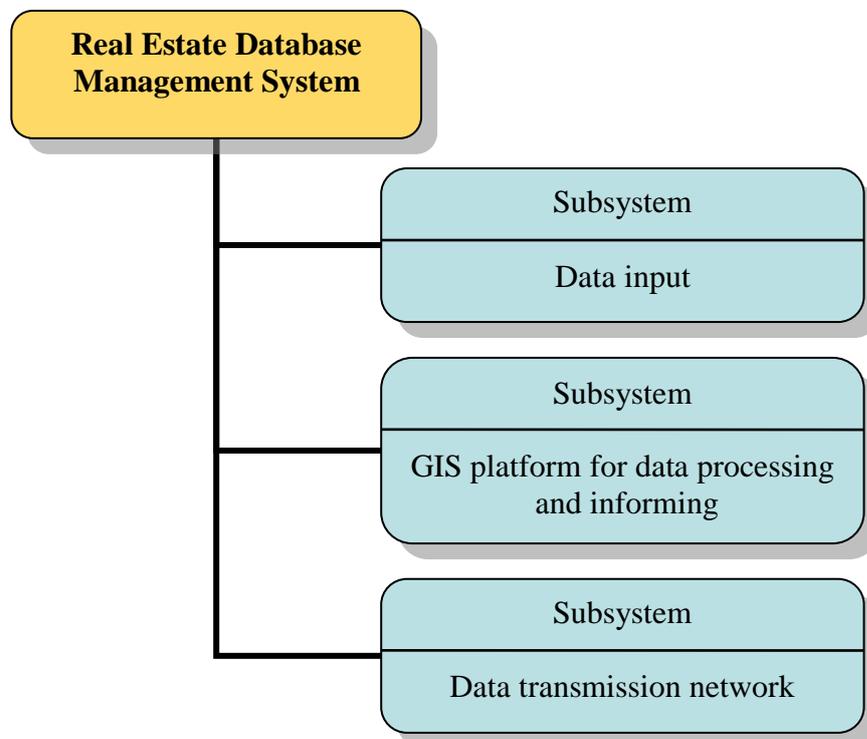


Fig. 1. Database Management System architecture

The architecture of proposed system is open, allows subsequent changes, extensions and is made based on standards related to the real estate appraisal.

The database management system was created using the Geographic Information System. It analyzes spatial location and organizes layers of information into visualizations using maps. The GIS platforms offer tools for special spatial analysis in order to learn the real space, with the help of which data is collected, managed, analyzed and displayed in order to obtain a reasonable market value of a real estate property. [1], [5]

In order to create the data base, was used AutoCAD Map 3D which allows use of spatial data from many popular file formats used in GIS. Thus, DWG files of the program AutoCAD can be used, as well as raster images, spatial data from different data bases or files, or attribute data. As source of spatial data one can use: data bases created with Oracle, SQL server or other similar data base programs, Autodesk SDF files or ESRI SHP files, AutoCAD drawings, Excel files or raster images. The program allows work with CAD objects, as well as with geospatial data, and a map can be exported in a DWG format in order to be visualized in AutoCAD too, which does not allow the interpretation of relations between objects and data sources. [6]

The database was created in Microsoft Access softwear, for attaching the database was used *Map Explorer – Data Sources*, (Fig.2).

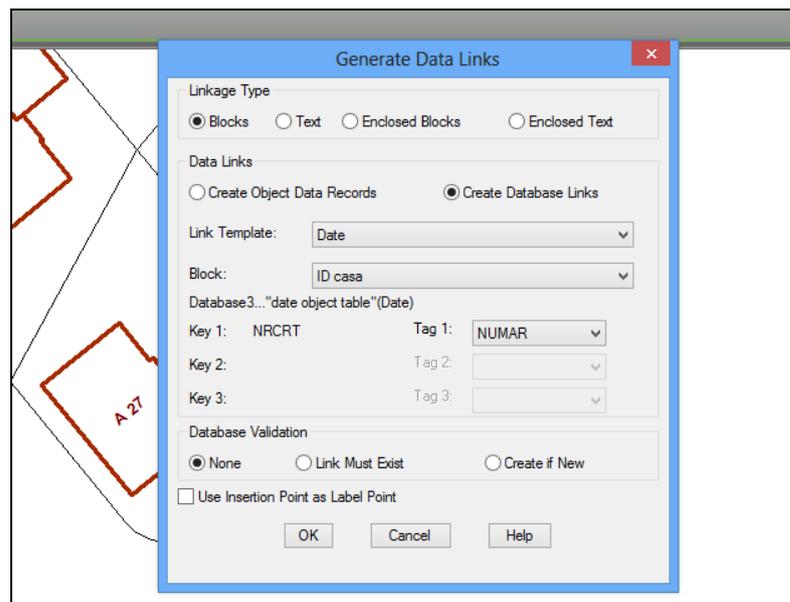


Fig. 2. Generating the link between data and buildings

Usually, a database is memorised in one or several files. The database is manipulated with the help of database management systems. The most common type of database is the relational one, in which data are memorised in tables. Apart from tables, one relational database may contain indexes, stored procedures, triggers, users and groups of users, data types, security mechanisms and transactions management mechanisms etc. [2]

The Buildings Table was created; it contains fields with details of the property and of existing buildings, structural components, details on finishes, facilities, size, materials and installations, the condition of each described element, the current usage of the property and the price of land and building, (Fig. 3).

Suprafata terenului	Utilitati	Nr. nivele constructie	Structura	Finisaje	Orientarea cladirii	Garaj/loc parcare	An constructie	Suprafata construita	Suprafata desfasurata	Suprafata utila
368.26	E, A, C, G, Tf	P+M	puternica	medii	N-E	garaj	2011	77.77	135.21	94.65
374.24	E, A, C, G, Tf	P+M	puternica	medii	N-E	garaj	2011	78.77	137.86	96.50
373.33	E, A, C, G, Tf	P+M	puternica	medii	N-E	garaj	2011	78.77	137.86	96.50
372.41	E, A, C, G, Tf	P+M	puternica	medii	N-E	garaj	2011	78.77	137.86	96.50
371.50	E, A, C, G, Tf	P+M	puternica	medii	N-E	garaj	2011	78.77	137.86	96.50
370.53	E, A, C, G, Tf	P+M	puternica	medii	N-E	garaj	2011	78.77	137.86	96.50
368.06	E, A, C, G, Tf	P+M	puternica	medii	N-E	garaj	2011	78.77	137.86	96.50

Pret unitar teren (mp)	Pret unitar constructie (mp)	Pret teren	Pret constructie
242	1047	87292.57	101034.28
242	1047	106981.09	119154.43
245	1050	129557.65	158795.98
245	1050	129912.24	158795.98
245	1050	130106.09	158795.98
245	1050	129605.00	158795.98
245	1050	128781.08	158795.98

Fig. 3. Buildings Table. Management of data from the database

### 3. Results and discussion

In real estate assessment, one of the main methods used is the market approach. This offers an indication of the value by comparing the subject asset with identical or similar assets, for which the prices are known. In this method, the first step is to obtain the trading prices of the identical or similar assets, recently traded on the market. If there are few recent transactions, the prices of identical or similar assets that are listed or offered for sale may be considered, provided that the relevance of such information is clearly established and critically analyzed. [7]

It is important in the assessment process to have information regarding real estate transactions or bid prices. This requires the transparency of the real estate market, by having knowledge about the real estate transactions.

The proposed database contains data centralized from the real estate market. It presents the traded real estate properties prices and other relevant public-known information. It can be used by both sellers and buyers, and can also be accessed by local authorities or other institutions, such as banks or notaries. It is also useful in analyzing the volume of transactions and the price trends, through which the margin between supply and trading prices, and the entrepreneur's profit will result. [8]

The proposed database system contain 3 subsystems, (Fig.1):

- Data Input subsystem: the trading prices required for the database can be taken from the sale-purchase contracts, which are in the possession of sellers, buyers, real estate agents, notaries, local authorities, banks, utilities suppliers. Another source of information could be the National Agency of Cadastre and Real Estate Publicity (ANCPI) and the e-Terra system (electronic integrated system for cadaster and land registration). The e-Terra system, which is designed to manage property data, is a mandatory unitary system of technical, economic, legal evidence of national importance for all real estate across the country that contributes to the creation of a real basis for the assessment, taxation and guarantee property [9].

- GIS platform subsystem: GIS platform for data processing, support for informing, data visualization, and statistics. In Fig.4, Fig.5 the query to the platform is shown.

- Data transmission network subsystem: modern communications technologies such as the Internet.

The database is of useful help in the assessment process because it collects information on assessed or traded properties, which is centralized and transparent, facilitating the assessor's work.

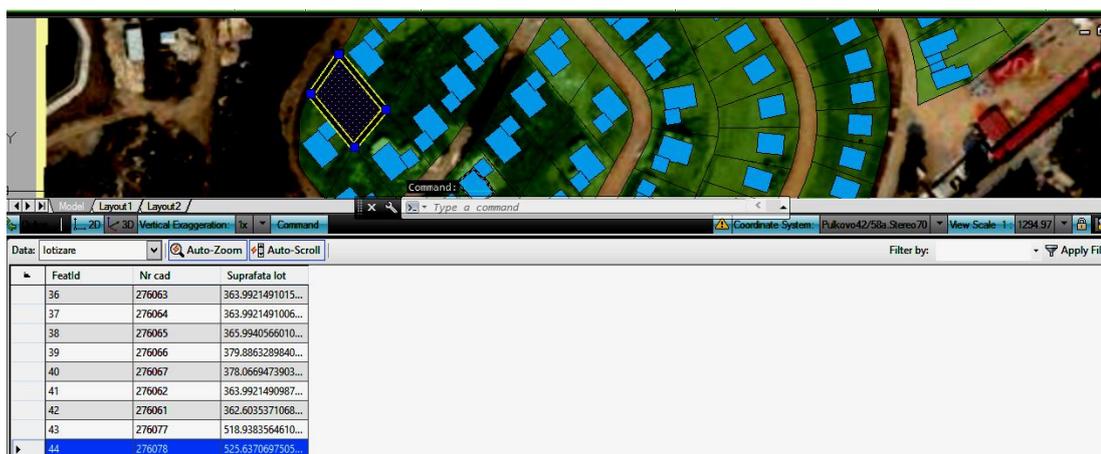


Fig.4. Checking the database

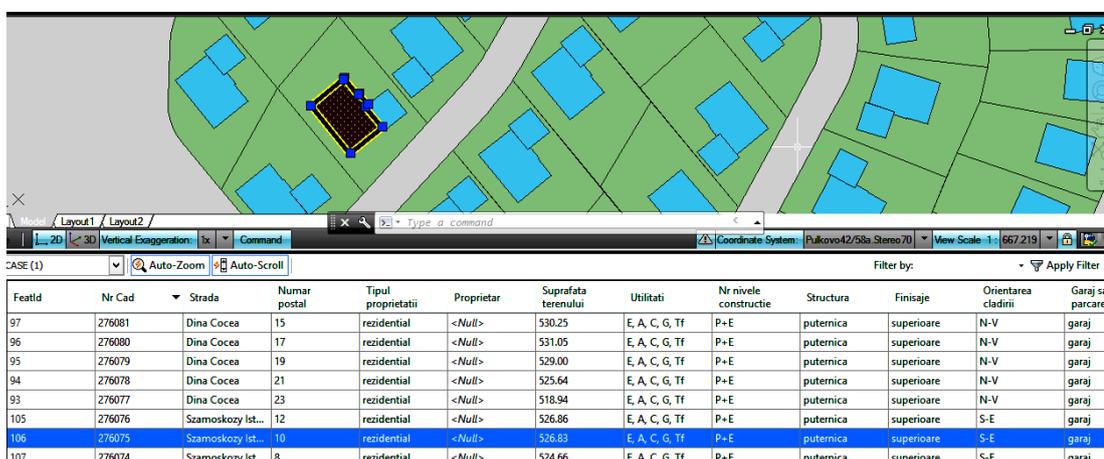


Fig.5. Display of related data from the database

#### 4. Conclusions

To conclude, the proposed database management system contains data taken from the real estate market with the specific characteristics of the traded properties, such as trade price. The database system was created using the Geographic Information System, it offers information on traded and assessed real estate properties, can lead to a better use of resources and can help the assessor establish a reasonable market value of the property.

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