

Design of Real Estate Valuation Information System and Implementation: An Example of Yenişehir - Mersin, Turkey

Mehmet ALKAN and Ferihan OZFIDAN, Turkey

Key words: Real Estate Valuation, Geographical Information Systems (GIS)

SUMMARY

It is essential to value real-estates which play a very important role in the economical and social life of man. Land valuation which has gained great importance in our country in recent years has not yet been studied scientifically. Because of this finding different values for a real estate leads to some economical and social problems in property tax, nationalization, purchase and sale and banking. So valuing should be objective, correct and accredited considering the facts of quality, environment and usage conditions. As a result, an information system should be developed that can help a valuation expert to obtain social, legal and technical data on a real estate, reach its location easily and analyse certain information. It is possible to use Geographical Information Systems (GIS) that gather all data according to certain standards analyse them and present them effectively to the user.

In this study, a design of system which is likely to help real estate valuation firms and valuation experts in the sector of valuing real estate's works efficiently, fast and fruitfully is aimed. Thus, the data which experts need, processing steps in the period of developing the system and software are presented. Then, the data based on appraising is carried out at a region of the Municipality of Yenişehir, Mersin. In the last stage, the data is stored; the inquiry is done on the data which is stored in the system.

In this study, with designing system, obtaining the present data is become easier, comparing and checking appraising processes have been provided to valuation experts. In addition, job efficiency and improvement of success are presented to firms and valuation experts.

Design of Real Estate Valuation Information System and Implementation: An Example of Yenişehir - Mersin, Turkey

Mehmet ALKAN and Ferihan OZFIDAN, Turkey

1. INTRODUCTION

Land for people, social and individual existence is the cause. Since people being sedentary earth, economy, law and society is constantly on the agenda. Territory became subject of urban usage, will be installed within the boundaries of the zoning by function and this function by function in the real estate market gains value. There are many uses for that value (Nişancı, 2005).

Nowadays real estate appraisers have been appraised real estate based on their intuition or experiences. Now that the concern with securitization of real estate is brought to attention, the technique of appraising the real estate more logically, quantitatively and accurately is required (Tanaka and Shibasaki, 2001). The pricing of real estate has been studied extensively since the early 1980s using a variety of methods (Din, at all., 2001).

Immovable property of the economy that are subject to lease, purchase, sale, barter, easement to be, at the land-kind and limited rights establishment, immovable partially or completely expropriation, nationalization, partnership capital in kind, such as almost all transactions with the real estate tax the income can be received real value of known depends.

Objective of immovable property (objective), to determine the correct and safe way; immovable property owners, sellers, buyers as their interests, are also important in terms of social economy. Immovable property constitutes a large part of social wealth. Everyone wants to know the correct value of real estate owned (Aclar ve Cagdas 2002).

Nowadays, the determination of property values, scientific, objective, quantitative, objective, and the use of sensitive methods are required. Comparison with conventional valuation methods in the valuation of real property, revenue, cost methods are insufficient. Regional data base because many spatial organization is required. In recent years the development of computer technology and information systems, has contributed significantly to real estate valuation. GIS technology to the needs required by the user query and analysis can be performed easily (Nisançi 2005).

Real estate valuation is very important components for a lot of applications such as tax, expropriation, urban planning, building or condominium planning in Turkey. For this purpose, nowadays General Directorate of Turkish Land Registry and Cadastral office has been worked a pilot project of real estate valuation system. Despite all these studies, there is no real model for Turkey country now (Wyatt 1997). On the other hand, real estate valuation should be have an information system which is relationship with not only cadastral information system but also e- government.

In this study, main aims is to design and design and develop of real estate valuation information system and implementation. This system has an information about valuation of the real estates.

2. STUDY AREA

Yenişehir Municipality was founded in 1995. Mersin is a city which is south Mediterranean Sea region of Turkey. Total area is 3,118,000 m² of Yenişehir part. 126 493 people living in Yenişehir depend on 2000 census. Yenişehir consist of 18 district as a governmental body (Figure 1.). Besides, there are 37 schools, 4 higher scholl (MYO), 20 health kuruluşu, 5 shopping centre, 7 bank office and 2 hotel in the Municipality area of Yenişehir.

In this study, Yenişehir town was selected test areas. Mersin Greater Municipality consist of Akdeniz, Toroslar and Yenişehir Municipalities (Figure 2.).

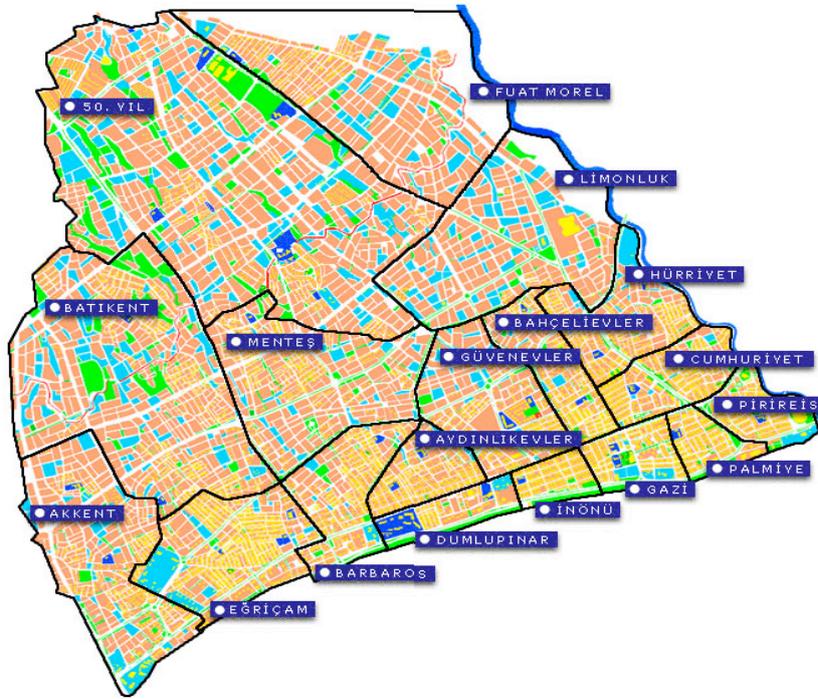


Figure 1. Districts of Yenişehir Municipality (Özfidan, 2008)



Figure 2. Mersin city plan and Yenişehir Municipality (Özfidan, 2008).

3. DESIGN AND DEVELOPMENT OF TDBS

In this section, firstly requirement analysis of TDBS is given. Then, the selection of data model and the design of database for TDBS are explained.

3.1 Requirement Analysis

Requirement Analysis is first phase of the design and development of database. Requirement Analysis consists of data and query for database design. Selection of data and determining of queries are very important which is determining of the database structure. (Alkan and Bulut, 2010). In this study, all of the data and queries are selected for design and development of TDBS for Yenişehir. After determining of requirement analysis, we have a lot of data and queries. Some of the use cases are presented below:

- Occupation of real estates,
- General characteristics of Buildings on any parcel,
- General attributes of condominium,
- Address information of real estates,
- Specifications of condominiums,
- Zoning status of parcels which is no buildings,
- Land registry information of parcels and condominiums,
- Total numbers of flats and number of flours belongs to buildings,
- Owners information of condominiums,
- Buildings and condominiums which has building license and occupancy permit,

- Buildings that is under construction level,
- Governmental areas,
- Shopping centres,
- Unit price of the parcels,
- Average unit price of the condominiums,
- Sales value of the real estates.

3.2 Database Design

Spatial objects are formed with parcels and buildings constructed within parcels. These spatial objects are represented with the “polygon” data type in the database. Besides, road is also spatial object are represented with the “line” data type in the database. Other data information is attribute data which is parcels, buildings, roads, address, taxes information and etc.

With respect to database design, parcels and condominium data are maintained in different tables. Figure 3. shows a portion of the database schema. In these tables, data changed a little like area of parcel, owner’s name and surname, condominium number is stored. Because of this, only relevant information is changes not general information when a parcel is divided, a condominium is sold. In this way, repetition of data does not occur.

Concerning the “key” of the tables, composite keys are used. The components of the keys are “Object_id” for parcels and condominiums, Owner_id, stored date (tmin) (Oosterom & Lemmen, 2001). Object_id is a compound value consisting of the codes of province (two characters), district (two characters), neighborhood (village) (three characters), block (five characters), parcel (five characters), and condominium (three characters). Owner_id is the unique identity card number of the citizens of Turkish Republic.

PARCEL									
<u>Object id</u>	<u>Owner id</u>	City	Town	District	Map Number	Section Number	Parcel Number	Area

BUILDINGS						
<u>Object id</u>	<u>Building id</u>	Age of Buildings	Elevator type	Numbers of flat	Car park information

CONDOMINIUM							
<u>Building id</u>	<u>Condominium id</u>	<u>Owner id</u>	Lot	Area	Number of rooms	Occupancy permit information

OWNERS								
<u>Owner id</u>	Name	Last name	Father's name	Birth date	Birth place	Sex	<u>tmin</u>

Condominium – Tax						
<u>Object id</u>	<u>Owner id</u>	<u>Tax id</u>	Tax Debt	Debt date	Paid of tax debt	<u>Paid date</u>

Figure 3. A portion of the database schema

4. RESULTS

4.1 Example of Queries for UIS

With respect to the requirements analyses performed in this work, a database design was carried out in Entity-Relationship (ER) model. The conceptual schema of ER model then was mapped into a relational schema for implementation. Temporal data are traced by “tmin” and “tmax” attributes proposed by attribute data was stored in MapInfo 9.0 v. software. The relationship between attribute and spatial data is established over “Object id” (in all tables). Attribute queries are done via SQL. When spatial data is involved in the query then MapBasic, the API of MapInfo, were employed. Some of the important queries for REIS will be shown in this part. This queries help to municipality for tracing, controlling and needing any data. In this paper some queries will be shown between figure 4. and figure 6.

Figure 4. shows real estate attributes which is belongs to any owner of any selected area. This example is about all of the real estate information of any owner. Municipalities needs this information for all of the owner for the tax collection.

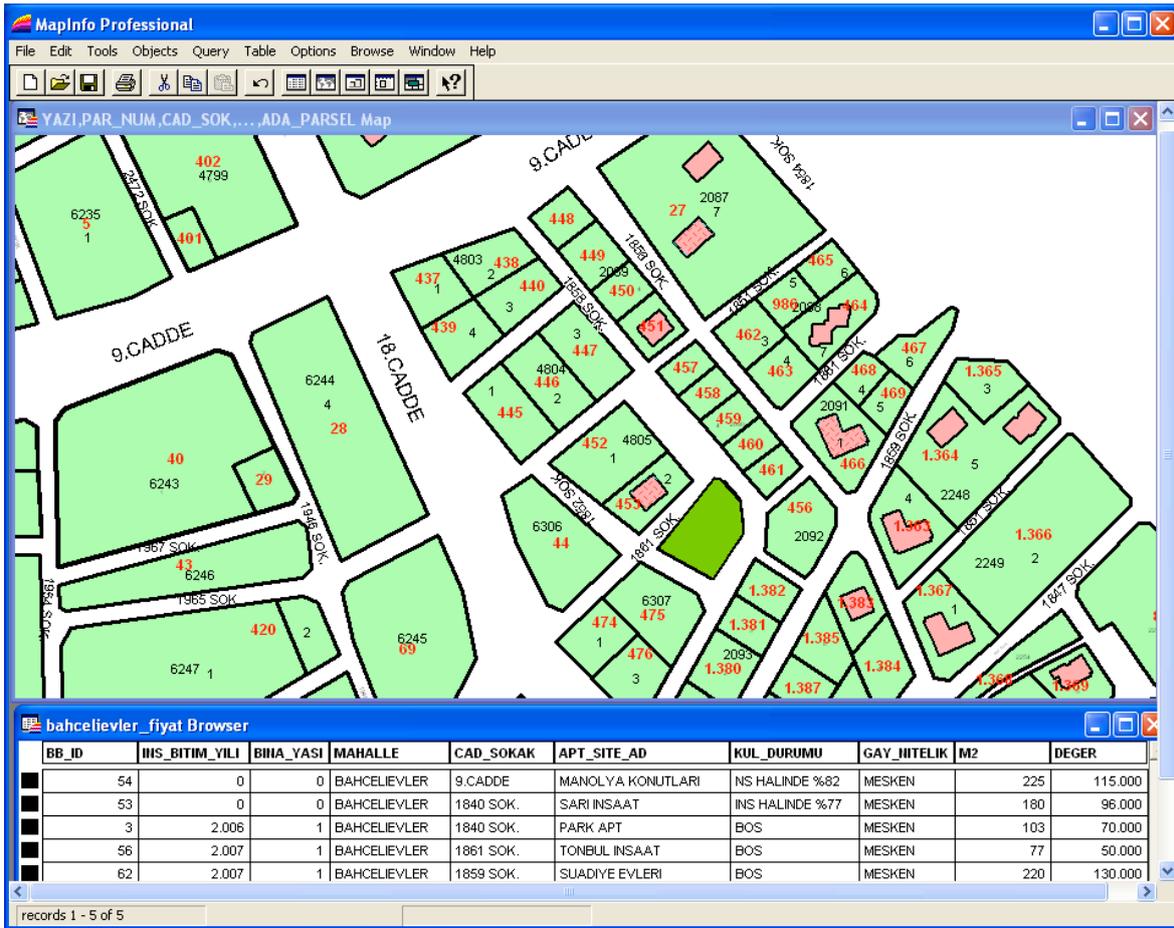


Figure 5. Real estate information of value, address and area which is selected region.



Figure 6. Condominium real estate valued and other information which is selected owner.

5. CONCLUSION

One of the most important features to the human is a request to acquire immovable property. These requests and traditions due to technology changes over time and can be renewed. Immovable property is increasing day by day the desire to meet the increasing requests must be provided in the presentation. Therefore, real property and value in society has an important position. Thus, real property constitutes a large part of the wealth of society and people want to know the correct value of real estate owned.

Of property values, an objective, accurate and reliable determination, real estate owners, buyers and sellers as it is important for the country's economy is of great importance in terms. In case of immovable property cannot be accurately determined from the expropriation of property tax, such as through privatization and land management, economic and sociological problems arise in many applications. Therefore, the real value in order to perform accurate, objective and scientific criteria should be evaluated in the context. In this context, the

evaluation of property values, an increase in real need of information and evaluation procedures must be grounded in a robust structure is an inevitable result for the country's economy.

For valuation of immovable property appraiser who will determine the price of any kind regarding real estate, spatial, economic, social, legal and technical inquiry and will be able to examine an information system should be safe. However, in our country, a system for the collection of real estate values are not yet available. In this context, affecting property values in specific standards of data collection, analysis, and presented to the user in question is possible to take advantage of GIS technology. Nowadays, real estate valuation information system is very important for cadastral and property systems for all over the world.

In this thesis, the integration of GIS with real estate valuation is established. In this study, real estate appraisal company serving the appraiser of their work and hands design is made of the existing real estate GIS system using the information. In addition, some samples were analysed in this study.

REFERENCES

Alkan M. and Bulut G., 2010. GIS and remote-sensing-based urban-information system design and development: A case study for Kozlu, Zonguldak. Scientific Research and Essays. Vol. 5(19), pp.2889-2899.

Aclar A. and Cagdas V., 2002. Taşınmaz (Gayrimenkul) Değerlemesi, TMMOB Harita ve Kadastro Mühendisleri Odası, Ankara (In Turkish).

Din, A., Hoesli, M., Bender, A., 2001, Environmental Variables and Real Estate Prices, Urban Studies, Vol. 38, No. 11.

Nişancı R (2005) Coğrafi Bilgi Sistemi İle Nominal Değerleme Yöntemine Dayalı Piksel Tabanlı Kentsel Taşınmaz Değer Haritalarının Üretilmesi, Doktora Tezi, KTÜ Fen Bilimleri Enstitüsü, Trabzon (In Turkish).

Ozfidan F., 2008. Design of Real Estate Valuation Information System and Implementation: An Example Of Yenişehir, MsC Thesis. Zonguldak Karaelmas University.

Tanaka, H., Shibasaki, R., 2001, Creation of Spatial Information Database for Appraising the Real Estate, 22nd Asian Conference on Remote Sensing, Singapore.

Wyatt, P.J., 1997, The Development of a GIS-Based Property Information Sysyem for Real Estate Valuation, International Journal of Geographical Information Systems, Vol. 11, No. 5, 435-450.

BIOGRAPHICAL NOTES

Dr. Mehmet Alkan is an Associate Professor in the Department of Geomatics Yildiz Technical University, Turkey. He graduated from Department of Geodesy and Photogrammetry Engineering at KTU in 1994. He received his MSc in February 1997. He finished Ph.D. in March 2005. His Ph.D. thesis topic is “Design and Develop Cadastral Temporal GIS”. He is research interests are Database, Geographical Information Systems, National Spatial Data Infrastructure, E-Municipality, E-government and Cadastral Systems. He is currently works at Land Management Division of the Department of Geomatics at Yildiz Technical University.

Mrs. Ferihan Ozfidan is a MsC. Degree Engineer in Turkey. She graduated from Department of Geodesy and Photogrammetry Engineering at Zonguldak Karaelmas University in 2005. She received his MSc in September 2008. She is MsC thesis topic is “Design of Real Estate Valuation Information System and Implementation: An Example of Yenişehir”. She is research interest are Database, Geographical Information Systems, Property and Real Estate Valuation.

CONTACTS

Associate Prof.Dr. Mehmet ALKAN
Yildiz Technical University,
Civil Engineering Faculty
Department of Geomatics
34220 Esenler /Istanbul
TURKEY
Tel. +90 212 3835295
Fax + 90 212 3835210
Email: alkan@yildiz.edu.tr
Web site: <http://www.yarbis1.yildiz.edu.tr/alkan>

Mrs. Ferihan Ozfidan
Sehitler Tepesi District
Ataturk Street No: 220
33420 /Tarsus/Mersin
TURKEY
Tel. +90 324 6257929
Email: alkan@hotmail.com