

Database System Architecture for Fiscal Cadastre

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SUMMARY

A Cadastral system enables the government to establish an efficient and equitable system for levying land and property taxes. Levying this tax-based on value, income or revenue requires information on location, size, and ownership or stewardship of the land or property.

A feasibility study is the first step in implementing a successful fiscal cadastre system. Therefore properties taxation system was reviewed as one of the executive organizations to familiarize activity pattern and data needed in database. The conceptual design and ER Diagram of the fiscal cadastre system is primarily an exercise in database design then logical model of database and designing required processes were completed and finally database were created physically and process were implemented.

It was observed that using flexibility which exists in database of cadastre and using spatial data the efficiency of executive and administrative structure of property tax system could be optimized. With implementing and executing above maintained steps and their results it seems necessary to apply cadastre to modify and to develop all steps of property tax system assessing tax case, tax estimation and receiving.

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1. INTRODUCTION

Although receiving tax from properties as property tax and income tax as long history but legal and administrative infirmity, inaccessibility to comprehensive information about properties and the management of this about properties and the management of this information have presented to realize part of tax revenues. (table1)

Country name	USA	DENMARK	IRAN
Estate tax	9.4%	1.9%	----
Rent tax	----	2.0%	----
Transmission tax	----	.4%	.01%

Table1.Example of simple compare real estate tax (Yousefi, 2001)

Real estate and registration organization of IRAN for proper management about real estate and properties section has started cadastre plan Part of this plan's duty is presenting identification to all real estate and properties in Iran .planning and Implementing a cadastre system more over to contribute properties and registration system to ward best management of properties in country has numerous and executive organization in country.

Assuming existence minimum utilizing data in legal cadastre system, comprehensive identification of properties involved tax can be done perfectly.

With identifying duties, goals and creating steps of a fiscal cadastre and its Implementation it was observed that it is undeniable that its role and capability can promote all capacities of operation steps in taxation system, identifying properties involved tax, tax estimation and tax receiving.

Such results are as follow:

Preventing tax evasion

Effort toward realizing social and economical justice

In this research meanwhile modeling and inspecting information related to steps of executing a cadastre system (fiscal cadastre) a pilot project structure is studied too. It is evident that this present is based on last changes and direct tax regulations in taxation system of IRAN.

2. FEASIBILITY STUDY

The aim of conducting this step is familiarizing current situation and activity pattern In tax system of properties and cadastre system .evidently with analyzing current situation we can close to optimized fiscal cadastre system

2.1. Need assessment of properties tax system

The aim of this step recognizing current situations in real estates and properties tax system in country and this is related to needs of users, activities and current software and hardware

2.1.1. Activity pattern

Conducting activity pattern of properties tax is done in three steps:

a. Identifying tax case with analyzing current situation tax is defined in two situations such transmission tax and rent tax, identifying is done in three methods:

1. Referring of owners of properties
2. Referring of auditor to current file and documents
3. Referring of auditor to current location

b. Tax estimation

After recognizing, tax items are provide and in this way following resources are used:

1. Registration documents
2. Municipality documents
3. Presence referring to location
4. Existing circulars and instruments in ministry of economy

c .tax receiving

In this step executive units present tax receive receipts and tax receiving is completed

2.2. Valuation

One of the main components of a fiscal cadastre is valuation. In this part of study the main points regarding concepts of value, valuation method, etc. will be discussed.

2.2.1. Concepts of value

The starting point in valuation is to understand and define the concept of value usually for a good to have value it must have Utility, it must be Scare, and the must be a Desire for it.

Based on economics, several definitions for different types of value have been defined, that can be listed as followed (Ekert, 1990):

1. Use value

Use value can be defined as the level of satisfaction a good provide to whoever owns or consume it.

2. Exchange value

Exchange value is the amount of other goods that can be exchanged for a given good.

3. Market value

Market value may be defined as the highest probable price estimated in terms of money which a property will bring if exposed for sale on the open market under all conditions requisite to fair sale, allowing a reasonable time to find a purchaser who buys with knowledge of all the uses to which it is adopted and for which it is capable of being use.

4. Intrinsic value

Intrinsic value is the total cost of producing a good or the total cost of the constituents of the good and services required to assemble them

5. Capitalized value

Capitalized value is an estimate of the value, capitalized from the market assessment of the yield returns from good in present and future.

2.2.2. Single-property appraisal and mass appraisal

There are fundamentally two approaches to valuation .the first, single-property appraisal(direct market data approach) ,is the valuation of a particular property as of a given date ,based on the direct market information .the second, mass appraisal , is the valuation of many properties as of a given date ,mass appraisal depends on interpolation ,by formula from a sample of properties.(Robert,1976)

In this research, model specification is the determining of models based on appraisal theory and market analysis.

2.3. Feasibility study of cadastre system

Performing steps of activity pattern in cadastre

1. Collecting data required

In this step using different method such as ground surveying (mapping) and Photogrammetry data are collected and the primary graphical layer are provided.

2. Editing and control

In this step geometrical errors and polygons are removed and the topology of the layers is closed

3. Specification data

Names streets, roads, governmental, Industrial and commercial centers are transferred on map

4. Recognizing and parcel

In this step the strict ions and boundaries of areas are recognized and registration numbers are transferred

5. Ground controlling

To inspect geometrical correctness, this kind of controlling is used in case of any fault this error or fault is removed by metering

6. Preparing cadastre map

In this step all dimensions and areas of registration parcel are determined.

Need assessment in above step were performed based on activities pattern due to following reasons:

- a. Other aspects are extend
- b. Problems which occur in this study out of technical and systematic frame

2.4. Data requirements of a Fiscal Cadastre

Data are various and numerous in a fiscal cadastre and this diversity is different in each country for example in USA in about building more issues such as designing and manner of maintenance are considered too.

This reason that diversity of data cause to increase fiscal cadastre and time spending a balance should be put between incomes and costs or expenses, on the other hand tax revenue, increasing resulted more information should not impose huge costs to collect and to keep data it was tried

With answering following questions to decrease diversity of data and to create limitation.

- a) Can provide some data from other references?
- b) How can collect store recycle these data?
- c) Why tax information and data should be used as documenting data?

This is important that to present correct questions in this data bank the components of question and data parametric be correct and accurate until answer which is presented from data base be correct and accurate

3. CONCEPTUAL MODEL

A data model is a formal definition of the data required in a fiscal cadastre. The data model can take one of several forms; the two used in this guideline are a structured list and an entity-relationship. In this step need assessment were studied generally so it is necessary to study

needs of users in cadastre system and this regard spatial and no spatial data are chosen so following items were considered:

1. What analyses are important in fiscal cadastre?
2. Identifying required graphical layers
3. Identifying and discovering attribute items

The results of above mentioned evaluations are as follow:

- a. In a fiscal cadastre system the aim is evaluating properties and determining tax. So effective parameters in evaluating and analysis related to tax estimates have more importance rather than geometrical parameters,
- b. In selecting location data the most important graphical layer is parcel map.
- c. Recognizing propounded entities and their particulars in a fiscal cadastre system have been presented as figure.
- d. After determining local and descriptive data the relations of data are drawn as simple ERD. (figure1)

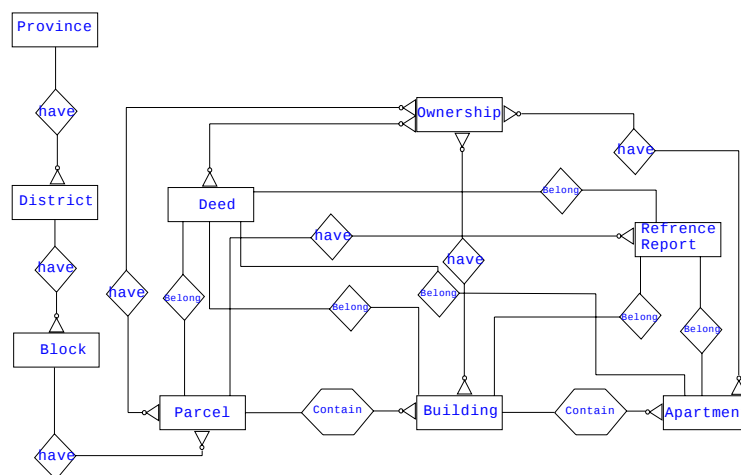


figure1. Shows form part of the Simple E-R Diagrams of the conceptual database

4. LOGICAL MODEL

In this step based on results of conceptual designing of system .required results and analyses are presented to computer, assessing entities in a fiscal cadastre system as table (for attribute data)and layers(for spatial data)and presenting algorithms are main step in this section.

5. SPECIFICATION SYSTEM

In this step at first software and hardware are selected.

5.1. Hard ware specifications

1. High speed in process and transferring various data.
2. Existence enough memory in system
3. Extendibility, developing and optimizing system respect to software, organizational and operational changes.
4. Condensability components of hardware such as printer, scanner
5. Adoptability with selected executive system

5.2. Software

Used software in this research were chosen based on user requirements to process spatial data AutoCAD software and to process attribute data , ACCESS software were used . Compilation graphical layers and attributes data we done by Arc View GIS software and Map Object component.

Database management was presented with Visual Basic language programming until user be able to implant the most efficiency analysis in selecting above mentioned software following items were effective:

- a. Contestability to data base.
- b. Ability in displaying and editing location and description data.
- c. Persian making possibility of user interface.
- d. Easy training.

6. PHISICAL IMPLEMENTATION

After selecting software and hardware environment the follow charts of executive process were implemented by visual basic programming.

6.1. Inspecting executive abilities

Due to need assessment in previous steps, three possibilities group were deemed.

6.1.1. Estimating transmission and rent taxes has been modeled based on the last changes.

In estimating tax, the user introduces data base way and its number and the results are displayed auditor can report results .in issue part printing, storing, sending on internet are exit. (figure2)

7. CONCLUSION

Cadastre as basic system such as attribute and geographically based on position of properties identifies all properties and its advantages are as follow:

a. identifying properties involved taxes

In identifying step using by parcel map of properties involved tax are identified advantages of using graphical layers.

1. Controlling and supervisions current operation in tax estimation processes
2. Identifying properties involved tax
3. Documentation

b. effective on tax estimation and automation processes.

In a cadastre in addition to spatial data and the attribute data related to these layers constitute in formation kind of these data which are collected as data base effect on workflow and operation related to main missions of cadastre system

In tax estimation step using cadastre system cadastre can be used for evaluating and estimating taxes. Using this advantage cause

1. Necessary and related data are collected
2. Optimized model to evaluating and estimating tax is provided
3. By standardization and systemizing evaluation process the fault rate of auditor is reduced

c. optimization management

Tax system of country as cadastre using base management system can enjoys following advantages

1. Reducing expense
2. Preventing time loss
3. Presetting better services

In the third step tax system using by this system can control all requests of user respect to data base so it is not necessary that user follows physical details of file location and index planning and the possibility for focused controlling related to data security is provided.

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