A STUDY CONCERNING THE POSSIBILITY OF APPLY DIFFERENT QUERIES ON TEXTUAL CADASTRAL DATABASE

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Abstract: *An important operation in any textual cadastral database is the query task, to find data again on certain criteria. A query is a set of instructions that returns results that can be sorted, grouped or filtered. A query can create, erase or modify data. This article treats some aspects concerning the possibility of using several types of queries in a textual cadastral database.*

1. Introduction

A query is a set of instructions that can be used in database operations. "! Run" a query will fulfil these instructions. Besides returning the results, which can be sorted, grouped or filtered, a query permit changing cadastral data, as updating, appending and even deleting certain records. This article offers short descriptions of different query types that can be applied to textual cadastral database, depending on data that wish to be found.

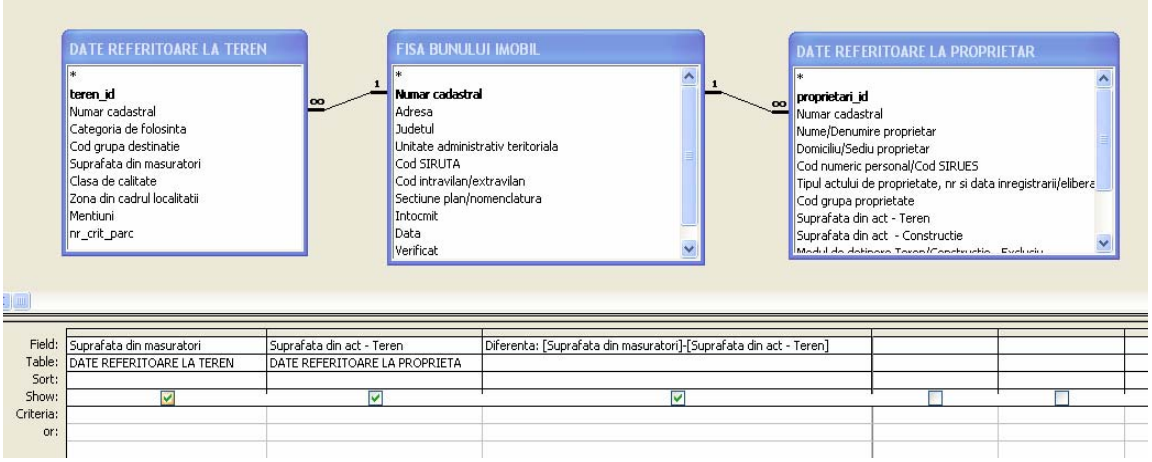
2. Operations concerning selection queries.

The operations concerning selection queries are referring to creation, performance (query running and data displaying), respectively data modification.

2.1. The creation of selection queries.

The creation of a selection query can be achieved graphically (default way) or in SQL way (through the construction of selection instructions using the declarative language **S**tructured **Q**uery **L**anguage). Option *Query* can be selected from the menu *Insert.* Appealing the option *New Query* and *Design View* will activate the window *Show Table* that offers the possibility of specification data source for the construction of the application. The data source for an application can be represented by one or many tables, queries or both of them. There are several stages for define a selection query:

- The selection of expected attribute from table/query were was created;
- The introduction of a valid Access expression in the row *Criteria* or in the row *Or* (figure 1), which specifies the selection criterion (implicit it will returns all the records for specified attributes). An Access expression can be inserting using the keyboard or with the aid of *Expression Builder* using the option *Build*.
- It can be specified, if it is necessary, the field/fields for a sort ands it's sense in the row *Sort*. Concerning the selection queries that have as sources multiple tables, Access uses the *Inner Join* operation that will select all the records that have correspondent in all the tables.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Cod grupa destinatie
Suprafata din masuratori
Clasa de calitate
Zona din cadrul localitatii
Mentiuni
nr_crit_parc
∞
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FISA BUNULUI IMOBIL
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Adresa
Judetul
Unitate administrativ teritoriala
Cod SIRUTA
Cod intravilan/extravilan
Sectiune plan/nomenclatura
Intocmit
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proprietari_id
Numar cadastral
Nume/Denumire proprietar
Domiciliu/Sediu proprietar
Cod numeric personal/Cod SIRUES
Tipul actului de proprietate, nr si data inregistrarii/elibera
Cod grupa proprietate
Suprafata din act - Teren
Suprafata din act - Constructie

Field:	Suprafata din masuratori	Suprafata din act - Teren	Diferenta: [Suprafata din masuratori]-[Suprafata din act - Teren]		
Table:	DATE REFERITOARE LA TEREN	DATE REFERITOARE LA PROPRIETA			
Sort:					
Show:	☑	☑	☑	☐	☐
Criteria:					
or:					

Figure 1.

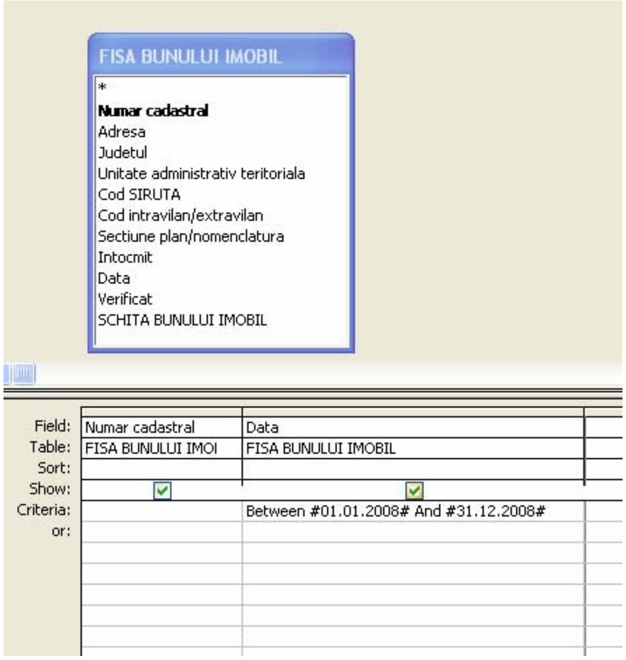
2.1.1. Calculable fields in the selection queries.

The selection queries can contain also calculable fields. These fields return, when the query is performed, the value of their associated Access expressions. It can be added a calculable field in a query using a new column. In this column type the name of the calculable field, after that add the colon and the wanted expression. My query from the figure 1 calculates the difference between the surface from measurements and the surface from papers.

The elements of an Access expression are: operators, constants, identifiers and functions.

The operators are classified in:

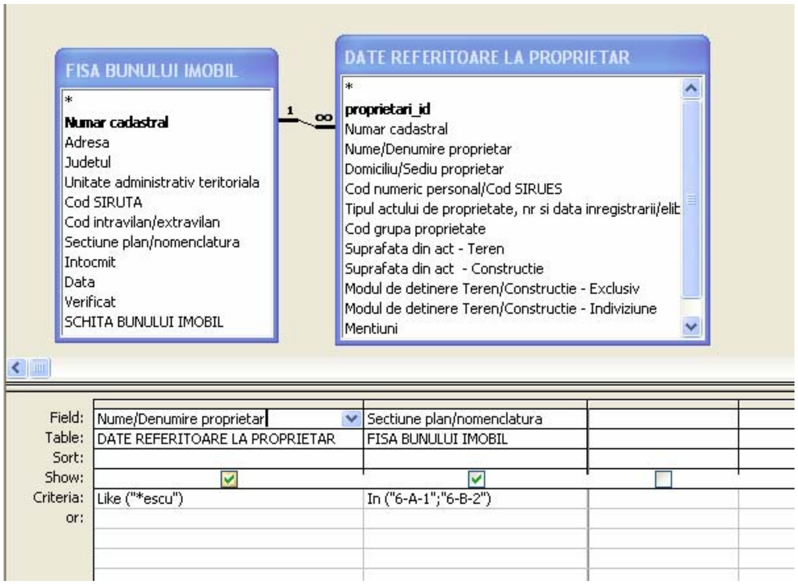
- *Arithmetic's*: +, -, *, /, Mod (returns the rest of dividing an integer) and ^ (in exponent progress)
- *For assignation and compare*: =, <, >, <=, > =, <>. These returns the logical values True or False.
- *Logics*: And, Or, Not.
- *For concatenate the strings of characters*: +, &
- *For identification:* ! and . (Point). These two characters are used as separators which combine the name of the collections.
- *For object:* to distinguish the name of the objects from those of properties.
- *Other operators: IS, LIKE, IN, BETWEEN*



Field:	Numar cadastral	Data
Table:	FISA BUNULUI IMOI	FISA BUNULUI IMOBIL
Sort:		
Show:	☑	☑
Criteria:		Between #01.01.2008# And #31.12.2008#
or:		

Figure 2.

The operator *BETWEEN* is used to select the records in a certain lapse of time. The query from the figure 2 will display the cadastral numbers issued in the period 01.01.2008 - 31.12.2008.



FISA BUNULUI IMOBIL
*
Numar cadastral
Adresa
Judetul
Unitate administrativ teritoriala
Cod SIRUTA
Cod intravilan/extravilan
Sectiune plan/nomenclatura
Intocmit
Data
Verificat
SCHITA BUNULUI IMOBIL

DATE REFERITOARE LA PROPRIETAR
*
proprietari_id
Numar cadastral
Nume/Denumire proprietar
Domiciliu/Sediu proprietar
Cod numeric personal/Cod SIRUES
Tipul actului de proprietate, nr si data inregistrarii/elit
Cod grupa proprietate
Suprafata din act - Teren
Suprafata din act - Constructie
Modul de detinere Teren/Constructie - Exclusiv
Modul de detinere Teren/Constructie - Indiviziune
Mentiuni

Field:	Nume/Denumire proprietar	Sectiune plan/nomenclatura	
Table:	DATE REFERITOARE LA PROPRIETAR	FISA BUNULUI IMOBIL	
Sort:			
Show:	☑	☑	□
Criteria:	Like ("*escu")	In ("6-A-1";"6-B-2")	
or:			

Figure 3.

The Access expressions using the operator *LIKE* permit the specification of some selection criteria for searching a string in a text. Inside the text it can be used the generic characters "?" (that replace any character in the position in which appears) and * (anything in the position in which appears and in the subsequent positions).

For example the expression *Like("*escu")* from the figure 3 shall permit the selection of all the owners with names that have the finishing part *"escu"*.

The operator *IN* specifies the lots of values admitted for an attribute. The query from the figure 3 shall select all the owners with name finished in *"escu"* and hold properties that received cadastral numbers in the zone delimitated by the map sheets *"6-A-1"* and *"6-B-2"*.

The constants used in Access expressions can have a numerical nature (for example 206265, 06), text (for example:"44","Iustin") or calendar date (for example #11/06/2008# that indicates data 6 November 2008).

The identifiers are Access object names (tables, attributes, forms) such as in the example:
[Forms]![Form FISA BUNULUI IMOBIL]![Numar cadastral].
The values for the criteria definition can be taken over from the previously created forms through the mediation of identifiers.

The functions can be different kinds:

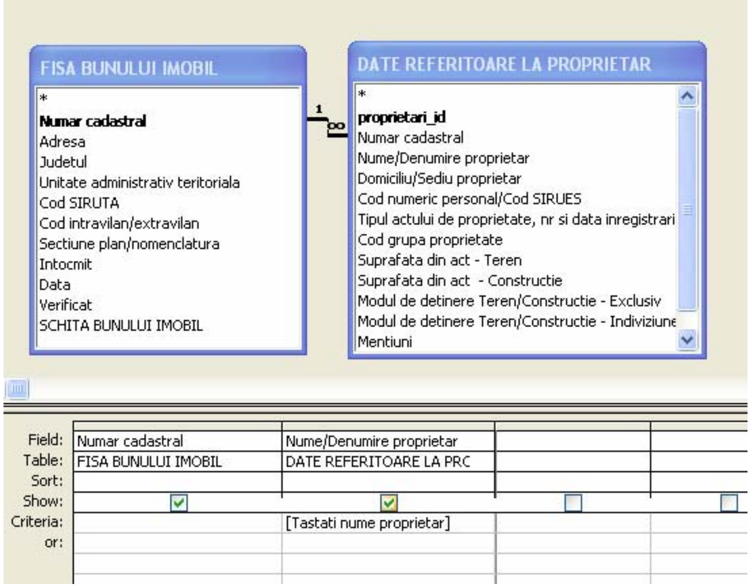
- *Mathematics*: *ABS()* returns the absolute value of a number, *INT()* returns the integer part of a numerical value, *ROUND()* rounds off a value with a certain number of decimal, *SUM()* calculates the sum, *AVG()* calculates the arithmetic mean and so forth.
- *Text function*: *Len()* returns the length of a string, *Trim()* eliminates the spaces from beginning and the ending of the string, *Left()* returns first *n* characters from the beginning of the string.
- *Calendar date: Date()* returns the current date; *Month(Date())* returns the number of the current calendar month, *Year(Date())* returns the current year.
- *Financial functions: PV()* returns the current value of a paid annuity in periodical equal parts, *SLN()* returns the value of a fixed resource redemption after a certain period (linear redemption) and so on.
- *Other functions: ISNUMERIC(), ISNULL(),* et cetera.

3. Queries with parameters.

The selection queries presented until now return always the records from the source tables corresponding to a certain fixed criteria: all cadastral numbers issued in a certain period of time. Time and again, it is useful that the criterion of a selection query to be defined to a general level and personalized by user, depending on his inform needs (defining more accurately what recordings of the attribute are searched) just in the moment of the query performance.

Such query is characterized through the fact that in line *Criteria*, it is specified, between square brackets, a message that will be displayed when the query is performed, permitting for the user to enter the wanted selection criterion. (figure 4).

The parameters can be used not only in the row of criteria, but also in the formulae of calculated fields where variable terms of Access expression are necessary. The example from the figure 4 presents a query that shall solicit the name of an owner, displaying his name and his cadastral number(s).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Numar cadastral
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DATE REFERITOARE LA PROPRIETAR
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Domiciliu/Sediu proprietar
Cod numeric personal/Cod SIRUES
Tipul actului de proprietate, nr si data inregistrari
Cod grupa proprietate
Suprafata din act - Teren
Suprafata din act - Constructie
Modul de detinere Teren/Constructie - Exclusiv
Modul de detinere Teren/Constructie - Indiviziune
Mentiuni

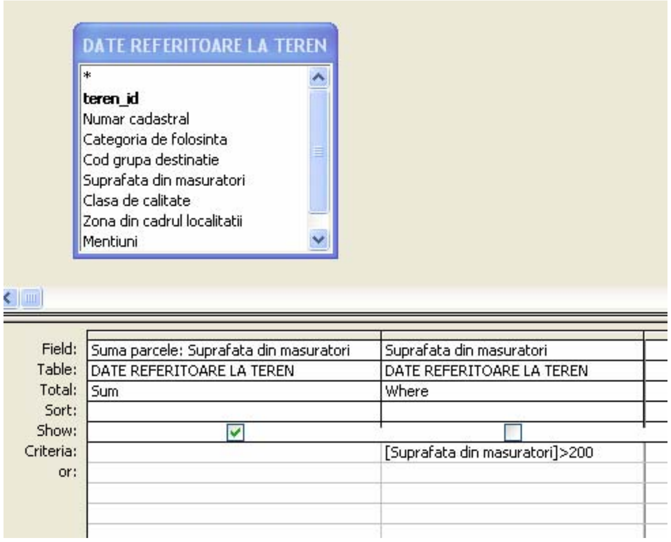
Field:	Numar cadastral	Nume/Denumire proprietar		
Table:	FISA BUNULUI IMOBIL	DATE REFERITOARE LA PRC		
Sort:				
Show:	☑	☑	☐	☐
Criteria:		[Tastati nume proprietar]		
or:				

Figure 4

4. Mixture data queries.

Access permits designing queries that can apply functions on certain recordings grouped under pre-established criteria. Using these mixture data queries it can be designed applications that can return the total, the average, maximum or minimum of recording groups.

To create a mixture data query it is necessary to add the needed fields, that include the calculated fields too, in the *Query Design* and after that activate the button *Totals* Σ from the bar of instruments. As a result of this operation, in the grid *Query Design* shall be available a new row entitled *Total*.



Field:	Suma parcele: Suprafata din masuratori	Suprafata din masuratori	
Table:	DATE REFERITOARE LA TEREN	DATE REFERITOARE LA TEREN	
Total:	Sum	Where	
Sort:			
Show:	☑	☐	
Criteria:		[Suprafata din masuratori]>200	
or:			

Figure 5

Implicitly all the columns shall have selected the option *Group By*. This option shall remain selected for the grouping fields, for the other fields can be used any needed function. The list of selection contains nine aggregate functions that are presented in the table 1.

Besides these functions, there are available the options *Expression* and *Where*. The option *Expression* is used for the calculated field that returns a single result at the level group. The option *Where* is used in the case in which a field have to be used for specifying a certain criterion of selection, but the user don't want to perform the grouping selection after the respective field. A field were the selection option *Where* is used can not come out in the output result of the query. The query from the figure 5 shall display the sum of parcels from the field "Suprafata din masuratori" that carry out the next condition: have the area bigger than 200 square meters.

Function	Return	Type of fields where can be applied
Sum	The sum of values	Number, Date/Time, Conversion, Domain Aggregate
Avg	The arithmetic mean	Number, Date/Time, Conversion, Domain Aggregate
Min	Minimum value	Number, Date/Time, Conversion, Domain Aggregate
Max	Maximum value	Number, Date/Time, Conversion, Domain Aggregate
Count	Total number of values	All types
StDev	Standard deviation of values	Number, Date/Time, Conversion, Domain Aggregate
Var	Variation of values	Number, Date/Time, Conversion, Domain Aggregate
First	First value	All types
Last	Last value	All types

Table 1.

5. CrossTab Queries

The *CrossTab Queries* are very useful in the aim of multi-dimensional analysis of data, permitting to acquire synthetic situations similar pivot-tables acknowledged from Microsoft Excel. Access permits elaboration of tables where grouping and sorting can be achieved so much on rows as on columns and at their intersections accomplish complex calculations. The steps for performing a *CrossTab* query are:

1. In *Design View* choose the data tables and select the necessary fields for display and in case of need, the fields that have enforce restrictions.

2. From the menu *Query* select the option *CrossTab Query* and the effect is the appearance of the rows *Total* and *CrossTab* in the grid query.

3. Specify the way of data aggregate, respectively the functions in the field *Total*.

4. In the field *CrossTab* make one’s choice for *Row Heading* in the case of the fields that will be displayed on rows table and *Column Heading* for the fields displayed on vertical and *Value* for the values displayed at the intersection of rows and columns. It is permitted the existence of several fields grouped on horizontal line *Row Heading*, but just one field with *Column Heading* and one field with *Value.*

In the figure 6, I presented the way to obtain the number of cadastral works made by authorized persons and displayed on years. I used the calendar function *Year(Date())* for displaying the columns and the function *Count* for the count cadastral works made by each authorized person.

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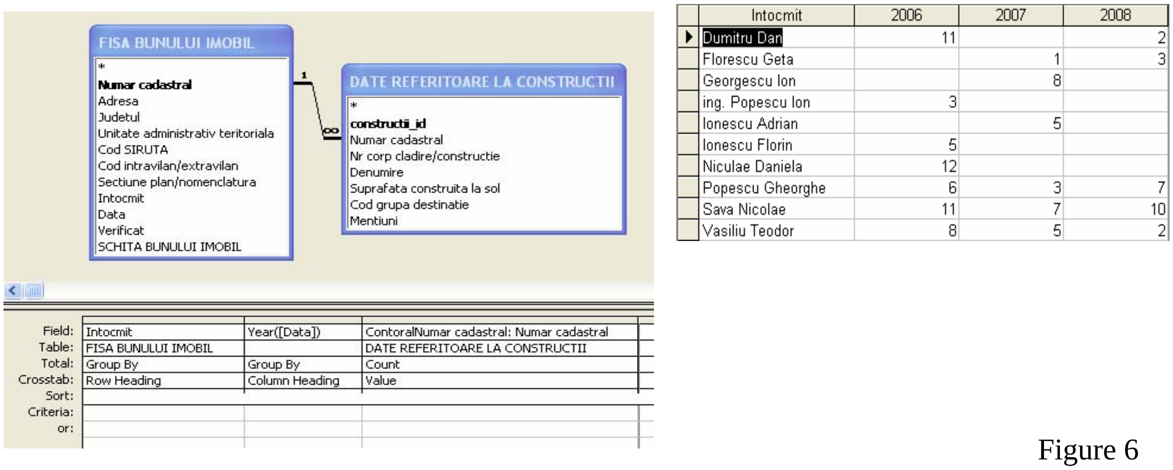
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Denumire
Suprafata construita la sol
Cod grupa destinatie
Mentiuni

Field:	Intocmit	Year([Data])	ContoralNumar cadastral: Numar cadastral
Table:	FISA BUNULUI IMOBIL		DATE REFERITOARE LA CONSTRUCTII
Total:	Group By	Group By	Count
Crosstab:	Row Heading	Column Heading	Value
Sort:			
Criteria:			
or:			

Intocmit	2006	2007	2008
Dumitru Dan	11		2
Florescu Geta		1	3
Georgescu Ion		8	
ing. Popescu Ion	3		
Ionescu Adrian		5	
Ionescu Florin	5		
Niculae Daniela	12		
Popescu Gheorghe	6	3	7
Sava Nicolae	11	7	10
Vasiliu Teodor	8	5	2

Figure 6

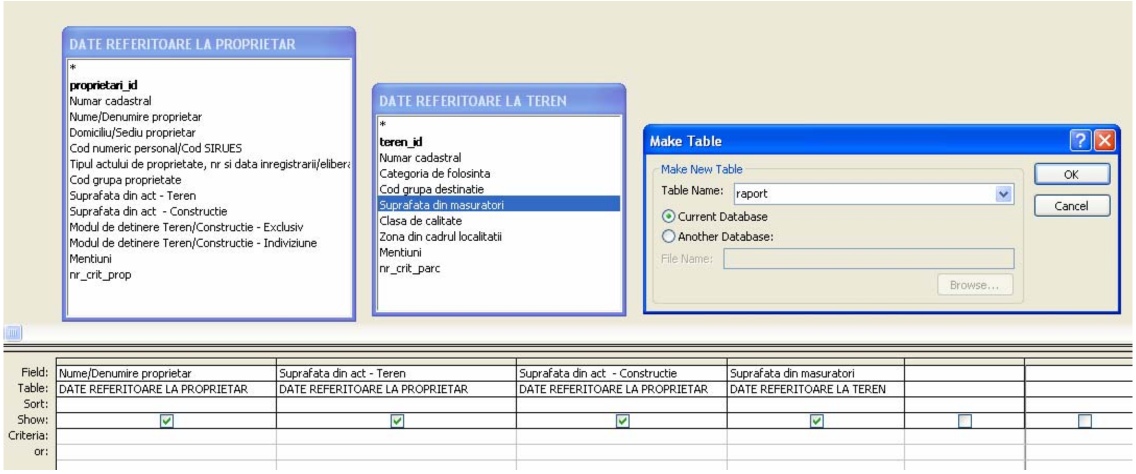
6. Action queries

Access puts at users command a distinct category of queries that permit operating and updating data. These queries can have as a result to create a table (*Make-Table Query*), data update (*Update Query*), the addition of recordings (*Append Query*) and the erase of recordings (*Delete Query*). The way of elaboration a query is similar as in the case of select queries, having as supplementary stage the explicit stipulation of the action type query from the *Query* menu.

6.1. Make-Table Query

The creation of new tables based on recordings from the tables already existing implies the run through the next stages:

1. The elaboration of a select query in *Design View* in which shall be taken in the calculus just the fields from the structure of new table.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Nume/Denumire proprietar
Domiciliu/Sediu proprietar
Cod numeric personal/Cod SIRUES
Tipul actului de proprietate, nr si data inregistrarii/elibera
Cod grupa proprietate
Suprafata din act - Teren
Suprafata din act - Constructie
Modul de detinere Teren/Constructie - Exclusiv
Modul de detinere Teren/Constructie - Indiviziune
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Categoria de folosinta
Cod grupa destinatie
Suprafata din masuratori
Clasa de calitate
Zona din cadrul localitatii
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nr_crit_parc
Make Table
?
X
OK
Cancel
Browse...

Make New Table
Table Name: raport
● Current Database
○ Another Database:
File Name:

Field:	Nume/Denumire proprietar	Suprafata din act - Teren	Suprafata din act - Constructie	Suprafata din masuratori		
Table:	DATE REFERITOARE LA PROPRIETAR	DATE REFERITOARE LA PROPRIETAR	DATE REFERITOARE LA PROPRIETAR	DATE REFERITOARE LA TEREN		
Sort:						
Show:	☑	☑	☑	☑	□	□
Criteria:						
or:						

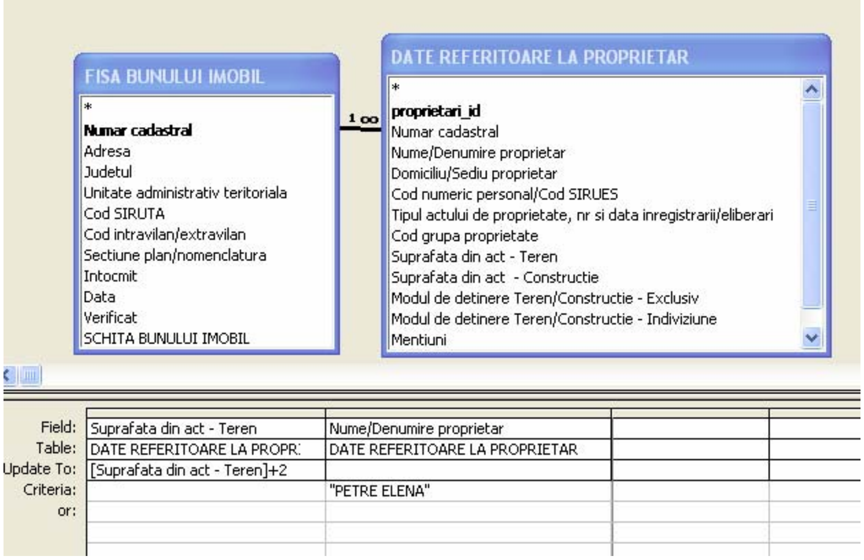
Figure 7.

2. Turning the option *Make-Table Query* from the menu *Query* and stipulation in the dialog box *Make Table* the name of the new table. The new table can be created in another database too, if is click the option *Another Database* and is specified the name of the file.

It has to be mentioned that the new table will inherit all the data types and dimensions of fields from the source table, but not the primary key and the properties at field level. If the name specified in the dialog box *Make Table* already exits, the old table with the same name will be erased before the generation of the new one.

6.2. Update Query

This type of queries permits the modification of data values from one or many fields of records that satisfies the restrictions settled by users. To perform an update query is necessary to select the fields that will be updated after the turning the option *Update Query* from the menu *Query*.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Nume/Denumire proprietar
Domiciliu/Sediu proprietar
Cod numeric personal/Cod SIRUES
Tipul actului de proprietate, nr si data inregistrarii/eliberari
Cod grupa proprietate
Suprafata din act - Teren
Suprafata din act - Constructie
Modul de detinere Teren/Constructie - Exclusiv
Modul de detinere Teren/Constructie - Indiviziune
Mentiuni

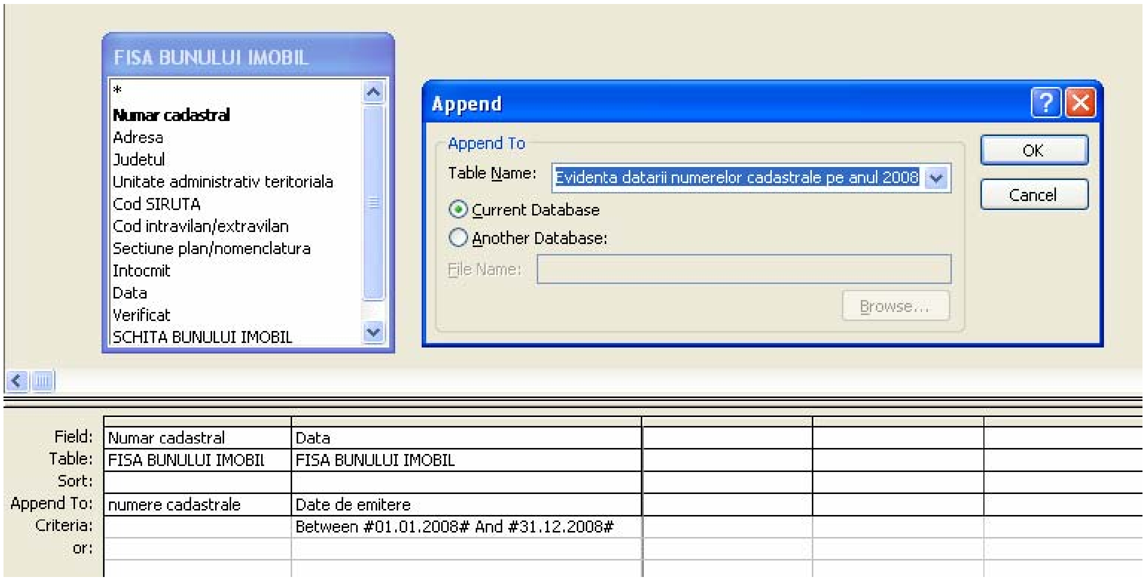
Field:	Suprafata din act - Teren	Nume/Denumire proprietar
Table:	DATE REFERITOARE LA PROPR:	DATE REFERITOARE LA PROPRIETAR
Update To:	[Suprafata din act - Teren]+2	
Criteria:		"PETRE ELENA"
or:		

Figure 8.

As a result of this operation shall become available the row *Update To:* in which is shall be completed the formula or the value needed for update.
For illustrate, I presume that the ground surface from papers of the owner ”Petre Elena” were recorded erroneously, with 2 less meters. For the update of this value I perform the update query from the figure 8.

6.3. Append Query

The append queries offer the users the possibility of insertion new records in tables starting from the existing records. There are similar steps in performing an append query as in the previous queries with the difference that from the menu *Query* it shall be selected the option *Append Query*. As result of this operation shall become available the row *Append To:* in the window of query project.. In this row it shall be specified for each field from data table the name of corresponding field from the table were the data will be append. In the figure 9, I added in the table *”Evidenţa datării numerelor cadastrale pe anul 2008”* the fields ”numar cadastral” and ”data” from table *”Fişa bunului imobil”,* adding as criteria the selection year 2008.



FISA BUNULUI IMOBIL

- *
- **Numar cadastral**
- Adresa
- Judetul
- Unitate administrativ teritoriala
- Cod SIRUTA
- Cod intravilan/extravilan
- Sectiune plan/nomenclatura
- Intocmit
- Data
- Verificat
- SCHITA BUNULUI IMOBIL

Append

Append To

Table Name: Evidenta datarii numerelor cadastrale pe anul 2008

● Current Database

○ Another Database:

File Name:

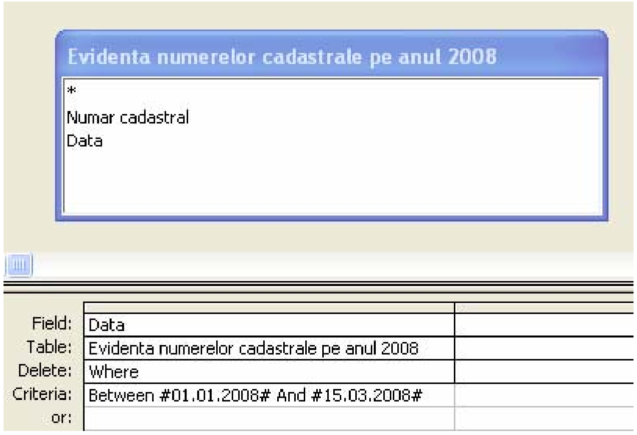
Field:	Numar cadastral	Data
Table:	FISA BUNULUI IMOBIl	FISA BUNULUI IMOBIL
Sort:		
Append To:	numere cadastrale	Date de emitere
Criteria:		Between #01.01.2008# And #31.12.2008#
or:		

Figure 9.

6.4. Delete Query

The delete queries offer the possibility of erasing different records based on some restrictions imposed by user. This action concomitant with the cascade erase option configured in the window *Relationship* can manage a simultaneous erase of data from many tables.

From menu *Query* the option *Delete Query* will start a delete query where the user will select the fields to be deleted and imposed criteria for this operation.



Evidenta numerelor cadastrale pe anul 2008

- *
- Numar cadastral
- Data

Field:	Data
Table:	Evidenta numerelor cadastrale pe anul 2008
Delete:	Where
Criteria:	Between #01.01.2008# And #15.03.2008#
or:	

Figure 10

7. Conclusions

To query a database means considerably more than selection of individual records. The queries presented in this article show that it can be obtained remarkable results through processing textual cadastral databases. Also these queries permit at big scale changing cadastral data, as updating, appending and even deleting certain records.

8. References

1. *Didulescu C., Săvulescu C., Sisteme informatice de evidență cadastrală, 2004, Vol.II, Editura Conspress, Bucureşti*
2. *Florescu V., Anica Popa L., Bases de données & SGBD, 2001, Editura ASE, Bucureşti*
3. *ISO, Database language SQL, 1992*