# Use and application of the External Databases for data organization and storage

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*Abstract*: - The external databases are some files which stock the information. We can create, edit or recover an immense volume of databases when we shall use the external databases for data organization and storage. AutoCAD offers the tools which allow us to work with some files that contain the external databases: we can open a database for data viewing or editing, we can bind the database records with the AutoCAD objects (lines, circles,  and so on), we can execute the queries in order to recover a data subset based on some criterions.

AutoCAD is designed such that to assure the access to the external database files without to use the application of database creation. AutoCAD recognizes the databases which have been created with the following Database Management Systems: Access, dBase, Excel, Oracle, Paradox, Visual FoxPro, SQL Server. We shall design an Access database in our paper.

*Key-Words:* - external databases,  AutoCAD objects, Access database, OLE DB configuration file, table, record, drawing, link, query

## 1  Introduction

We can work inside the AutoCAD programme with the external databases by using the AutoCAD tools.

The first stage of our work is to design a table in an Access database. The Access databases are built with the Access objects[1]. The main classes of Access objects are: tables, queries, forms, reports, macros, modules, pages[2].

The Access tables are the only objects which contain their proper data, while the other Access  objects contain some processing methods of the data tables, namely they directly or indirectly use the data from the tables[3]. Inside a table the data are grouped on records and fields.

We suppose that we dispose of the table *StudCmn* from the Access database *Stud*, having the following content[5]:

| Nume | Grupa | Seria | Cămin | Camera |
|------|-------|-------|-------|--------|
| Andreescu Mihai | 623 | A | P25 | 102 |
| Ene Ion | 622 | A | P25 | 101 |
| Ion Marian | 622 | A | P25 | 102 |
| Marinescu George | 622 | A | P25 | 102 |
| Mihăiescu Andrei | 622 | A | P25 | 101 |
| Vasile Aurel | 623 | A | P25 | 103 |

Fig. 1. Table StudCmn

The types and the properties corresponding to our table fields are:

Name- *Type*: **Text**, *Field Size*: 40;

Group- *Type*: **Number**, *Field Size*: Integer; *Decimal Places*: 4;

Series- *Type*: **Text**,  *Field Size*: 2;

Hostel- *Type*: **Text**,  *Field Size*: 4;

Room- *Type*: **Number**, *Field Size*:  Integer; *Decimal Places*: 4.

## 2  Creating of an OLE DB Configuration File
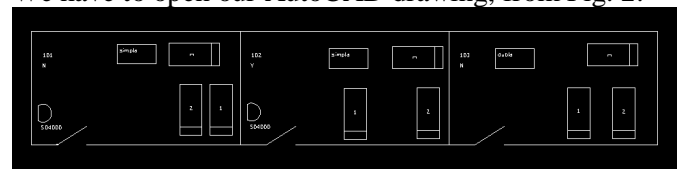
We have to open our AutoCAD drawing, from Fig. 2.



Fig. 2. A drawing made in AutoCad

The second stage of our work is to create an OLE DB (*Object Linking and Embeding DataBase*) configuration file. An OLE DB configuration file contains some information which are used by the AutoCAD software in order to have access to the data from the databases.

We can create this file in the following way:

a) we select $Tools \rightarrow dbConnect$ from AutoCAD;

b) we select (by clicking right mouse button) *Configure  Data Source* from the menu *dbConnect*; therefore AutoCAD will display the dialog box *Configure a Data Source*, see Fig. 3;
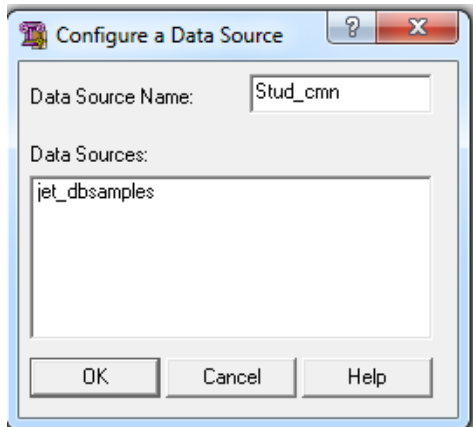
Fig. 3. Dialog box *Configure a Data Source*

c) we have to write a name in the text box *Data Source Name*; this is the name which appears in *dbConnect Manager* and which will be selected with a view to be connected to a database[6];

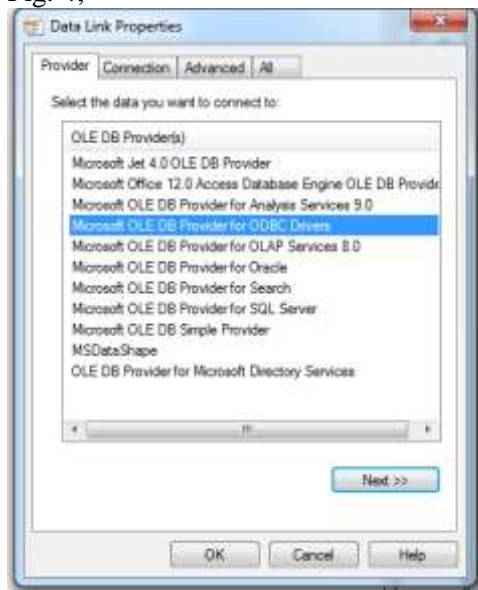d) we will execute click on OK for displaying the dialog box *Data Link Properties* from Fig. 4;



Fig. 4. Dialog box *Data Link Properties*

e) we select *Microsoft OLE DB Provider for ODBC Drivers* from the *Provider* page and we will execute click on *Next*; therefore the *Connection* page will appear;

f) in the *Connection page*, in the area of the step 1, it shall be selected the option button *Use data source name*[7], see Fig. 5;

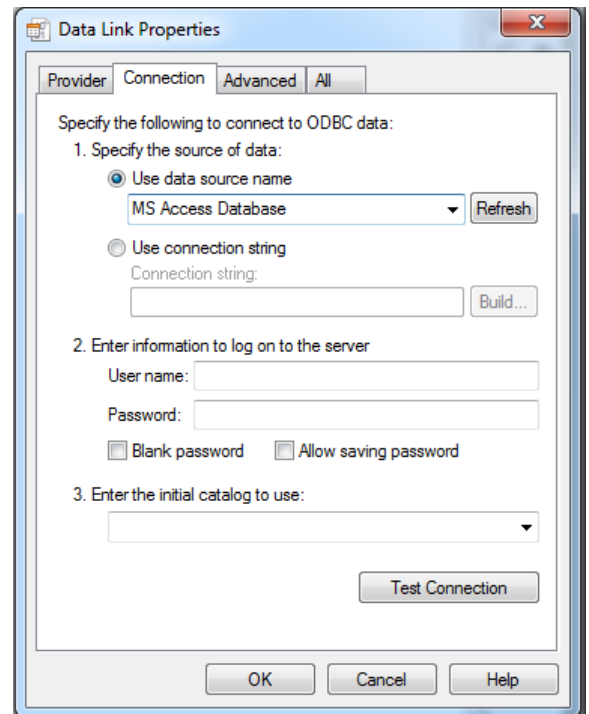

Fig. 5. Connection page from the dialog box *Data Link Properties*

g) we select *MS Access Data Base* from the list *Use Data Source Name* then OK;

h) to connect to the database Stud from the menu *Data Sources*, Stud Cmn is selected, one presses the right mouse button and one chooses *Connect*; therefore a window will appear where we can choose the used external database (Stud.accdb in our case), as in Fig. 6;
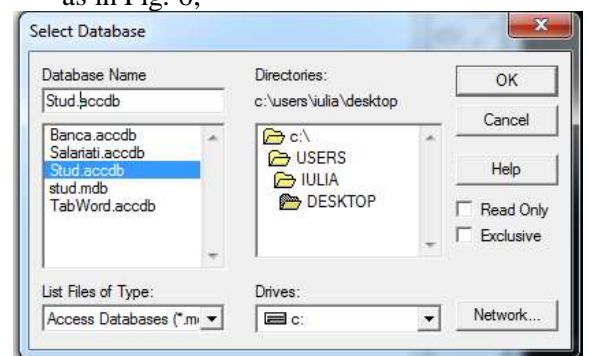


Fig. 6. Dialog box *Select Database*

When we shall push OK one closes the window *Data Link Properties* and we note that the OLE DB file was created (see Fig. 7). That means that AutoCAD can accede to the table *StudCmn* from the database *Stud*.

In the third stage we shall can work with the tables from our database, after the OLE DB configuration file was created. By pushing the right mouse button on the table name from the database we shall have the

possibility to: view the table data (*View Table*), to edit data in table (*Edit Table*).
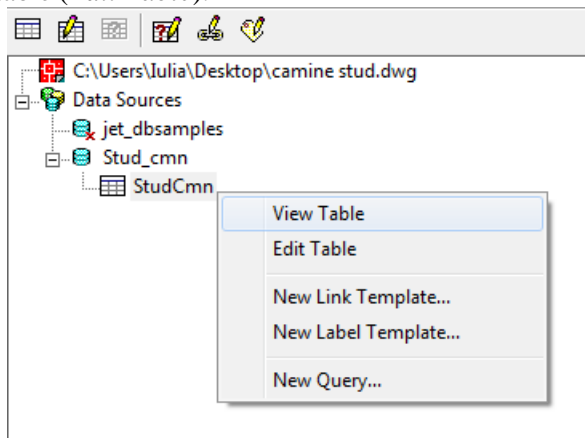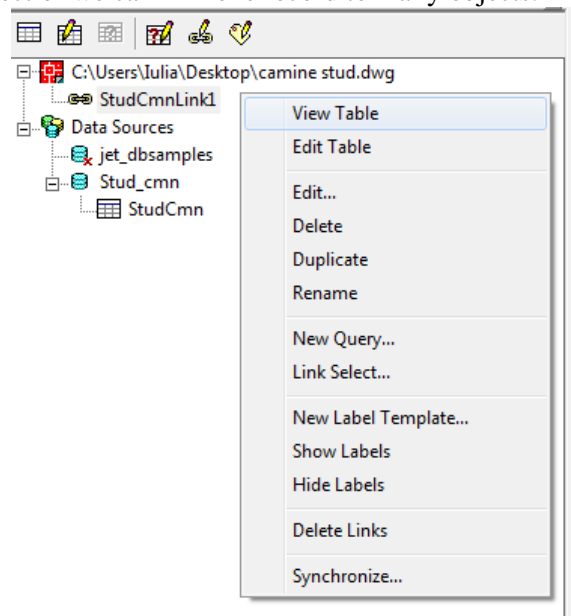


Fig. 7. OLE DB file has been created

## 3 The work with Data and Objects

In the fourth stage we can work with data and objects. AutoCAD allows us the creation of link between the records of one table and the objects from a drawing.

This link can be used in order to:
- locate the objects by selecting the records to which they are attached,
- locate records in the table by selecting some objects from one drawing.

In order to link the data from the databases to the objects from an AutoCAD drawing we have to:

1. create a linking template (*New Link Template*) which identifies that table field used for linking of a record to an object. For our example, we choose the field Name in the list *Key Fields*, see Fig. 8;
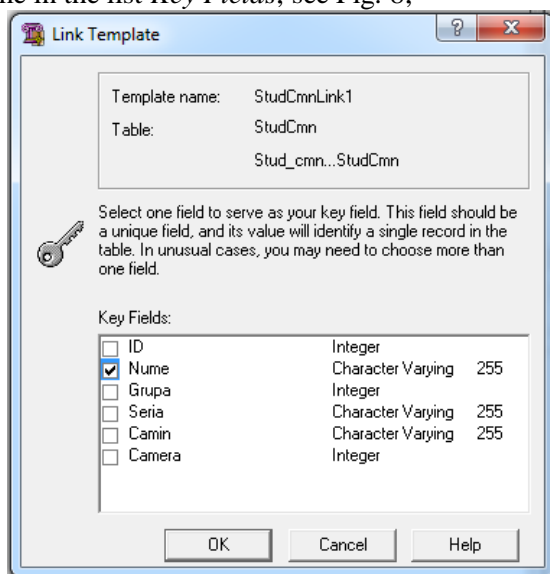


Fig. 8. Window *Link Template*

2. create the links; we can link many records to one object or we can link one record to many objects.



Fig. 9. Link StudCmnLink1

We shall establish the link among every student from the table and the objects from the drawing.

We push the right button of the mouse on the linking name (it was created to the step 1), namely on StudCmnLink1 from Fig. 9 and we select *View Table*.

We choose a record from the table and we link it to some objects from our drawing. For example, a student is "linked" to a room, a bed and a washbasin.

After the links have been established and we shall position on a record from the table, the objects which belong to the student will be outlined with dashed line if we push the button *View Linked Objects in Drawing*. Inversely, if an object is selected in the drawing and we want to know which of the records in the table is linked object we have to push the button *View Linked Records in Data View* and there is the answer.

## 4 Labeling of the Objects with Data from Table

In this stage we shall show that the links among the records of a table and the objects of a drawing can be used in order to label some objects.

For labeling of a object linked to a record from the table we have to:
- select *New Label Template* then push OK;
- select the page *Label Fields* from the dialog box *New Label Template* which will appear;
- choose a field from the list *Field* with *Add* which will be the label object;
- set the label style in the page *Character*; one chooses the field and one pushes OK in

order to save the displaying style which was selected for the respective label;

- position on a record in the window *Data View*;
- cross in the mode *Create Attached Labels* by choosing of the option: *Link and Label Settings → Create Attached Labels*;
- push the right button of the mouse, to choose *Link*, to select that object from our drawing which will be labeled and to push *Enter*; thus the object will be labeled.

In our example, we have labeled the bed from the room 102 with the name of the students which have these beds.

## 5 Using the queries

The last stage of our work consists of using of the queries. A query is that Access object which allow us to obtain:

- the answer to a question put of a database,
- the making of a table belonging to a database (data modification, addition or deletion of records),
- the data source (from one or more tables) for a object of type *Form* or *Report*.

We can construct and roll our queries by using the function *Query Editor* from AutoCAD. In order to open the window *Query Editor* we have to:

- to press the right mouse button on the name of the link StudCmnLink1 from Fig. 10;
- to select *New Query* and then to press *Continue*, after choosing the query name;
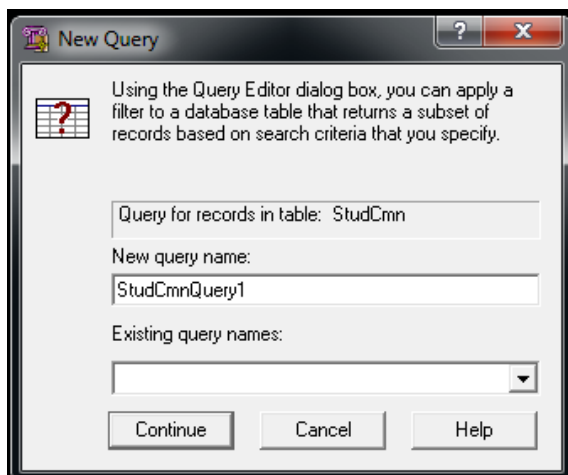


Fig. 10. Window *New Query*

AutoCAD disposes of four query pages (see Fig. 11):

1. *Quick Query* which allows us to define and to run a query by using the elementary operators like: Equal (=), Not Equal (< >), Greater than (>), Greater than or equal (>=),

Less than (<), Less than or equal (<=), Like, In, Is Null, Is Not Null.

2. *Range Query* allows us to define and to execute a query based on a value domain.
3. *Query Builder* allows us: to define and to run a query by using of some operators (see the point 1.) and of more value domains (than in the case of *Range Query*), to use the brackets in order to group the search criteria. Moreover, we can insert the logical operators *And* and *Or* in the aim of improving the respective criteria.
4. *SQL Query* allows us to define and to run a query by creating of some SQL instructions which are compatibles with the instructions from Microsoft SQL.
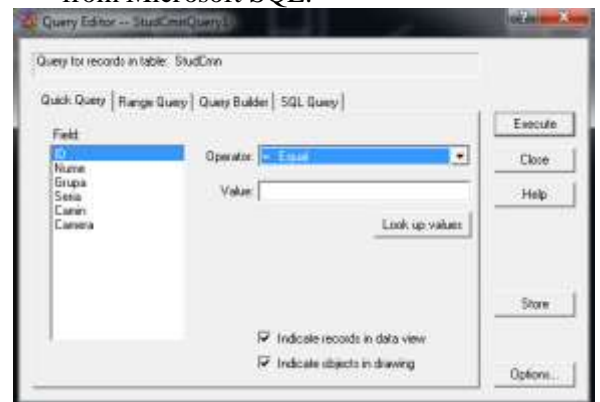


Fig. 11. Possible types of queries in AutoCAD

The simplest modality of creating a query consists of using the mode *Quick Query*. We can choose *Query Builder* in order to choose the records satisfying multiple conditions.

For our example, we have selected by a query (achieved with *Query Builder*) the students from the group 622 which live in the room 102.
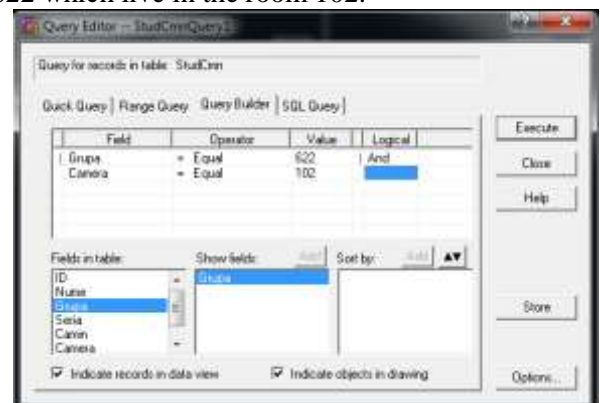


Fig. 12 . Using of the type of query *Query Builder*

# 6  Conclusion

The purpose of this paper is to prove that AutoCAD software can be used to have access to the data in a database. We have seen how to use the dialog box *Data Link Properties* in order to create an OLE DB configuration file which shows the location where a file is stored.

We have used:

- *dbConnect Manager* in order to have access to the tables an external databases,
- the window *Data View* in the aim of viewing a table from a database and of editing this table.

We have also linked our data to some AutoCAD objects and we have labeled some objects from an AutoCAD drawing with the extracted data from a table of an external database.

In the last section we have learned to create a query in order to search objects from an AutoCAD drawing or from a table.

By using the techniques of this paper you can associate an external database file with yours AutoCAD drawings and you can use the AutoCAD tools for working with data stored  in the table of a database.

# 7  Acknowledgment

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