

Creating Index of Properties on Archival Documents Using Relational Database

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Abstract: *The issue of immovable properties in Albania is completely different from other countries in region. During the communism regime every immovable property especially arable lands, forests has moved from individuals to state ownership by law. Political changes after '90 imposed changes in the immovable properties' issue too. Law reestablished the property's right. This new situation brought to focus of archival institutions a large amount of applications for access to documents of registrations and after II WW seizure of collaborationist immovable properties by regime. In order to find a solution for this problem, the Directory of National Archives proposed and developed a software application for indexing archival documents based on the names of ex-owners. For this reason a thorough study have been accomplished. It started by the defining the main entities included in this situation. Part of this analyze was the way in which the citizens and institutions applied for document's requests to archival institutions. After that, based on the knowledge collected we have created a relational database using SQL server as relational database management system and an application that serve as data entry and searchable application. Actually the application accounts for 1.7 million records and is characterized by high efficiency in searching and using procedures. In this article is demonstrated our solution, which use the relational databases as a tool for index information.*

Keywords: Index of property records, relational database, archival documents

1. Introduction

Nowadays exists plenty of software applications used for indexing and disseminating information. The relational database is a powerful tool that can be used to create indexing software due to the fact they are and will continue to be one of most usable tool for manage large data volumes [1]. Relational databases have many features such as storing unlimited amount of data and offering effective query procedures.

The capability of Information Technology in data storage and processing speed overcome any human strength in creativity and usefulness of the information. In order to be useful such large amount of available information must be organized into a format that is easy to understand and query, which is named as database design process. This process is very important and must produce "intelligent" solutions. Parsaye and Chignell [2] propose mapping knowledge techniques to develop intelligent databases. Mapping knowledge to the big picture of problem that we will try solve will give us a solution that manages the information in a natural and easy way. It includes extraction of the critical information from the huge volumes of available data. Based on this logic we created our logical model, which is simple, map the data as they are founded in daily routine processes of archival institution and overall meet the citizen's requirements.

2. The Logical Model and Interactive Query Modeling

The model presented in the paper is based on entity-relationship model, which has more advantages comparing with the other existing models and also adopts the closer natural view of the real world [3].

The Information technology has revolutionized the management of big information systems like archival information systems. The relational database is able sort out hundreds of records and returns the results of a query in a time frame of second. Searching can be defined through one or more than one search criteria. Saving the information into different tables linked together makes the indexing process an easy task.

To identify the documents that contain the property records, the processing stage needs to go inside each of them. But that procedure is not possible to conduct in automatic way when are handled old and hand written documents. For this reason a preliminary manually process was done by identifying in such way all relevant information regarding the immovable property, the property owner, the geographical location and archival references of documents. After that stage, information was mapped into a relational database into different linked tables. For ensure a high search performance were used clustered index techniques. During the process of information identification the following key features were considered:

- Gathering all comprehensive information about the documents that contain properties' information by the expert, familiar with archival documents and their preservation systems
- Selected information need to be evaluated based on its usefulness by archivist and as it is requested by citizens
- Information was systematically indexed by using hierarchical categories as it was applied by national archive.

Such Information and data was saved on six main tables: the fond table, the individuals_records' table, city table, village table, and role and user table. The fond is a logical concept that represents the total amount of documents created by a public authority during their operational time [4]. An

archival fond may include documents produced in different years. Documents that belong to a certain year are grouped into individual unit of descriptions (UD), or dossier, and each of them may contain from 1 to 200 documents. This organization corresponds to hierarchical levels defined on

International Standard of Archival Description (ISAD)[5]. Any UD has a set of elements such as number, title etc. that are very important to identify the UD in the archival collections. In the following figure is presented the table relationship of the TEP database.

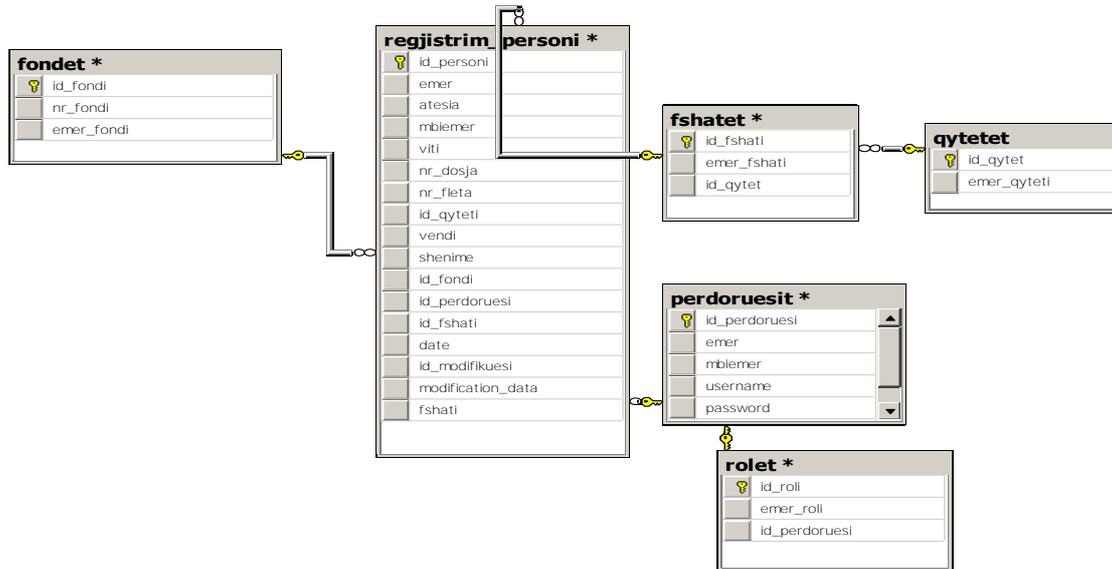


Figure 1: Table relationship in the database

If a particular document inside of an UD contains information about the immovable property, the specialized personnel identifies and records the name, father name (when it exist), surname, type of property, the geographical location and other relevant information about immovable property.

Defining the geographical location has not been an easy task, because the archival documents belong to different periods of times in the past. During these periods a certain village has been part of different neighboring district. To resolve this, we have created a possibility to enter a new village when it's founded in documents.

The user's table is used to save the data about the users of application. Users can have different role, and each role can perform a defined list of task.

Three or four criteria are all we need for a query in order to get information regarding the property records. These criteria may include name, father name, surname and city. They can be selected individually or in a combined form. In order to get a high query performance we have used the indexing functions of Sql server. The query was created on a view SQL Server and results are displayed in a datagrid view in which we have incorporated functionalities for order and printing. The following information sequence is presented search query fragment and displaying from of it.

```
Dim query as String = "SELECT dbo.fondet.nr_fondi as [Nr.fondi],
dbo.fondet.emer_fondi asFondi,
dbo.rregjistrim_personi.emer as
Emer,dbo.regjistrim_personi.atesia as Atesia,
dboregjistrim_personi.mbiemer as mbiemri,
dbo.regjistrim_personi.viti as viti,
dbo.regjistrim_personi.nr_dosjaasDosja,
dbo.regjistrim_personi.nr_fleta as Fleta,
dbo.qytetet.emer_qyteti asQyteti,
dbo.fshati.emer_fshati as
```

```
Fshati,
dbo.regjistrim_personi.vendi as Vendi,
dbo.regjistrim_personi.shenim asShenime
FROM dbo.fonde
INNER JOIN dbo.regjistrim_personi ON
dbo.fondi.id_fondi=dbo.regjistrim_personi.id_fondi
INNER JOIN dbo.fshati ON
dbo.regjistrim_personi.id_fshati=
dbo.fshati.id_fshati
INNER JOIN dbo.qytet ON
dbo.fshati.id_qytet=dbo.qytet.id_qytet
where emer=
"&txtkerkim.Text.trim&"""
```

And the search results

Table 1: Example of simple search result

Fond	Year	Number of UD	Number of document	Name	Surname
Këshillii Ministrave	1945	123	56	Naim	Zagori
Ministria e Bujqësisë	1946	209	145	Taip	Merluti

The database actually counts about 1.7 million and get rich with new records every day.

Application architecture and user interface

The application developed is a client-server application and have three main levels. The user interface, the application and database layer illustrated in the following figure 2:

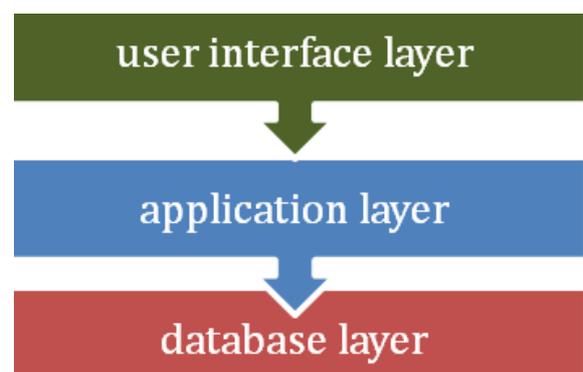


Figure 2: The query application architecture

The software application was developed using .net framework and sql server as database management system.

Every user needs to authenticate and to be part of active directory users in order to use and access the application. After that, based in its taskshe/he can insert, search or modify data. Due to sensitive data, it is accessible only in intranet.

The insert form is spread into three sections: archival section, location section and personal data section.

In the two first sections, the users do not need to insert data they just select the data from database. All data related with archival collections such are name of archival fond, number

of archival fond, the UD's belong to each fond are automatically imported from archival information system.

In the third section, users after define the archival references on the first section need to enter the data about the owners of properties and any other additional information founded about of it. To reduce the human mistakes were implemented a twice entry algorithm, which mean that the operator need to enter two times data into fields Name, father's name and surname equally, otherwise the process needs to repeat again data entering procedure. In this way we aim to increase the focusing to the procedure of data entry operators.

Figure 3: Data entry form of TEP application

The validation process occurs in two levels: in control level and database level.

Searching procedure is accomplished in the following way and may be produced based in only one information type or

all of four different information. The searching' results is appeared in a data grid view, which offers the printing and lining functions.

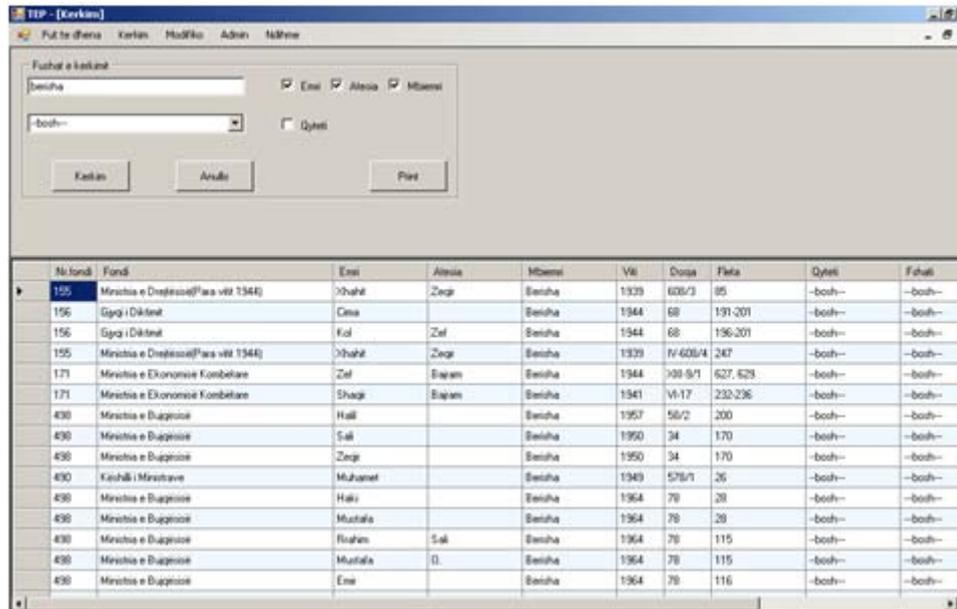


Figure 3: Search form of TEP application

This application offers the possibility to modify the individual data. For each change introduced; the system saves the date, time and the user ID, who has made the modification.

This application generates statistical reports related to the data presented in the system, such as: number of records processed daily by on user, how many records are included in an archival fond, etc.

3. Results

The 1.7 million records are classified by fond, year, unit of description and document's number. The database can apply different filters to show all records that belong to a certain archival fond. Also, filters may be applied to personal information of the owners such are name, father name and surname.

Search results are displayed in a useful manner using data grid view. They do not allow the modification by unauthorized users and every change in records is traceable.

4. Conclusions

The solution that we have implemented has resulted very helpful and useful. Now the citizens have a quick response from national archive institution. The archivists also have now a tool that may help them to do their job better and faster.

The application is efficient, can be used by different users over the network, and applies different searching criteria. Like any other software application, during their use new possible improvements are identified. They include the linking the original scanned documents with records in database. In such way everyone who has the right access can read and print them directly from the application.

Furthermore, creating e-services to governmental institutions, which need to access this kind of information

will reduce the processing time of procedures that covers the immovable property's issues.

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