

# KHAZAR UNIVERSITY

Department of Engineering and Computer Sciences

## **Master's Thesis.**

**Subject:** The network search system for the library.

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## Abstract

The thesis work is devoted to creation of software that was named as "Automatic Work Place of library's employer" that works with the NetWare database.

A theoretical basis of the databases was given in the beginning of the thesis. Further was described the main phases of projecting of databases. After standing of the problem it was in detail formalized, analyzed, divided to the sub-system, and then was written the source code for operations with databases.

The software was written in a Borland Delphi-5 environment, the database organization is in the Paradox-7 format. The code was probed and debugged. The program supports the proper work in a Network environment.

In addition, it can work in multilanguage mode.

In this project, the conceptual schema of data was introduced. The thesis possessed by a full description of created project and some part of it may be used as an introduction to its application.

In the final part of the thesis presented the basing of effectiveness of the project.

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3.6 The conceptual scheme of "Lookup" relations between tables

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## 1. Introduction

The automatic workplace (AWP)– it is the complex of software, including the databases, application programs and a set of additional products, what allows to users operate with his datum, make calculations, control the information in on-line mode, generate the solution, delivering from routine work [1]. Often so systems process by the properties of expert system – i.e. they may give the advisements, recommendations to users.

As a rule, these recommendations are based on a system of production rules (the logical rules, what built on the structure “if-then-else”). In the modern expert system applied the method of fuzzy logic (based on the notion “appertain degree”) – this model is more approximated to human type of mentality.

The base of software for all automatic workplace – is the DMS [2,3]. In addition of DMS is used the Packages of Applied Programs. Every of these Packages oriented to solution of any confined manage, information, search or other problems.

The AWP must be easy perceptible by a user. For this usually used the graphical methods of depicting of information: graphics, diagrams. It become accessible, when windows – graphics interface become the common – recognized standard of computers and information technologies. For more detail, the AWP divides to subsystems.

Subsystem is relatively independent component of functional structure of the AWP, intending for realization of any complex of its problems. Therefore, if we shall consider the AWP of doctor, we may discern the subsystems “Medicines”, “Wards”, “Ills”, “Deceases”, etc., and for to operating with every one applied the Package of Applied Programs. All these packages integrated in a DMS, serving the AWP.

The complex of software, using in the AWP must have permanent, on-line character – i.e. it must support the databases and theirs view in the actual situation – provide of opportunity of immediately currently changing.

In this view the main significance take a problem of stability. The AWP must anticipate and avoid the conflict situations.

When networks become the standard of modern information technologies, the remote one from another AWP may be internet in the mode of local Netware. The elaboration of network software of AWP is the most essential problem of DMS programming. Here programmer must separate the server and client parts, formalize and determinate the relations between them, and create a code, what may properly work with this system.

With developing the global networks, (so as Internet) grow up new information technologies, concerned with the DMS.

With the help of SQL – servers, storing and processing a huge volume of information, remote user may find the demanded information among them. For this applied such technologies as PHP, CGI, ASP, and another, what may up bring any degree of dynamics to Internet.

User may send the datum from form in the browser to the server, terminate the criteria of search in the queries, and etc. The special program agents, placed in a server may catch these queries, process it, and depict the results of query in a side of user.

The projecting of databases is one of the modern directions of the theory and engineering of information technologies [4-6]. The definition of datasets is so:

The database is the aggregate of data sets, united to creation of information model of object, using during information processing. The database – is the one of pivotal notion with composition and processing of information-reference (I&R) services, automatic-management systems.

The classic databases represent the consecution of monotype (i.e. with identical structure) datasets. So datasets are called “records”. Field of data is a component of datasets, reflecting information about one part of object. Field inside such dataset must be strictly typified. In each from theirs must be determinates the type of data, it’s length (taken size in the memory), permitted values, confinement, mandatory of data.

The task of programmer, who works with databases – is not only arrange the structure of databases – he must also proffer appropriate software, program complex, which would may operate with his database. This software called Database Management System (DMS) [7]. This DMS must represent the data, edit, erase and refresh the information, provide the connection with another database, search information in the database filter the records by any criteria, create the reports on their base. Database Management System must possess the clearness and simplicity of using, and be accessed not for only enhanced programmers, but also for users, who will exploit it in the prospective.

The theoretic of programming define the range of main tasks, what DMS must fulfill [8]:

- immediate data's management in the external memory (providing necessary structure of external memory for storage of data and service information, for example, indexes of fields for acceleration of access)
- management of buffers of on-line storage (operative memory). In view of DMS often work with databases of large volume, and for economical and effective distribution of operative memory, DMS works with databases not directly, but through so-called buffers, when DMS operate in the current mode only with any fixed fragment.
- control over the transactions. Transaction – is the consecution of the actions, considering by DMS as integrity. If transaction fulfilled properly, computer accept it and fix in the database changes. If transaction rejected, the database stay without changes. The idea of transaction essentially important in the DMS with supporting of many users (multi-user systems).
- providing the stability (steadiness) of databases – system must be able restore all data in its last position after casual unforeseen error of hardware or operation system. It may be reached by the way of reserving backup copies of files. DMS also may use journal for fixing all changes.

- supporting the special methods and languages for manipulate with databases.

Initially, in the early years of informatics, the storage of data was performed without regulating the fields. All records were organized as serial strings.

Later were elaborated special data formats and, allows to users store and edit information. (FoxPro, dBase, Paradox and etc.). These products include both the opportunities for editing the database and opportunities for creation special applied software by processing information.

So Access, the special software, what belong to Package “Microsoft Office Professional” allows users to storage large volumes of information, view, edit and analyze the data, create reports, create linked tables, filter and sort information, record and edit of macros, operate with SQL [9,10]. The term “SQL” is considerate in the detail later.

Generally, all databases divide to three parts:

- hierarchical;
- Netware;
- relational.

The hierarchical database is the structure of data, where each table considers as element of tree. The typical example of such structure may be a model of any office. Here we may observe the relation “chief - subordinate”, “department - office”, etc. Here every record-descendant may have only one record-ancestor, but one record-ancestor may have some record-descendant. That is why such system often called “tree-structured”. The main operations in the hierarchical databases oriented DMS – searching and transition from one object to another through common ancestor.

The Netware databases distinguish from hierarchical ones by the fact, that here one record-descendant may have some record-ancestor. The Netware database consists from a set of records and a set of linkages, describing the relations

between records. And here programmer must foresee both operations with datasets and operations with linkage of datasets. In considerate model, above described, we may see relations “employee – employee”.

The relational database is most popular model of databases. All data presented here as a consecution of identifiable records (tipples). The main advantage of relational database is it's simplicity of imagination – 2-dimension table, where horizontal rows signs the records and columns signs the fields. Most users, speaking about databases, imagine in their mind namely relational database. The relational database in the base guide by mathematical apparatus of theory of sets and first-order logic.

If we are telling about records and we suppose that each record in a database must be identical and unique, we must discern at least one field as primary (key field). – i.e. only one record may have this domain with such value. For example, in database of students it may be appointed number of student's ticket.

One of the modern technologies, applied to databases is SQL (Structured Query Language) – the language of interaction between user and database. The first model of SQL was elaborated in 70-es years. At first there was different standards of SQL, (for example, from firms IBM, Oracle, Informix), but starting from 1985-1989 years under committee ANSI/ISO semantics and syntax of the SQL was unificated.

The essential properties of SQL are the opportunities of simply formulated of queries with coupling of some relations and using subqueries in the selections predicts.

SQL allows select any records by one or some criteria, but SQL-technology more flexible and let to us more wide opportunities. So, we may operate with records. We may sophisticate criteria of selection, giving the conditions with mathematical or logical operands. We may delete any records from the base. We may view the data from two and more tables. We may create the reports with calculation of sum and average values of numeric field.



SQL consists from a set of special operators, each of their fulfill any functions by the manipulation with database.

In present time the most popular become distributed databases. The distributed databases – is a complex of databases, where different part of data presented in separate machines, linked one to another by network. Here the programming of DMS is closely associated with administration and configuration of nets (the resource allocation, the control of access, the preventing of conflicts and collision and etc). The main problem of distributed DMS consist in the providing of integration facilities, located in any nodes of network for organize so conditions for users, working in any remote node, what he may have access to all database, as to united database. At the same time high degree of affectivity, steadiness and stability must be ensured.

We may consider two kind of distributed DMS: when each database managed by it's personal system, and when all database managed by single unit. Architecture "client-server" is more interest and actual applied to databases, because it provides solution of multiusers access to network. "Client-server" conception is based on "open systems"(international-level standardized). The technologies of open systems provide proved opportunity of realization in software the portability (i.e. mobility) and interoperability (possibility of network's interaction).

Workstation is destined for immediate work with users and possessed the sufficient resources for local station. The server of network must be faster and possessed the resources, appropriate for it's specific function – volume of memory, size of hard drives, intense processor. The feature of the software is the flexibility of it's software – constancy of DMS, if will occurs any changes of net's topology.

Below are presented the examples of servers:

- telecommunication server;
- calculation server;
- disk server
- file server.

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- calculation server;
- disk server
- file server.

So, server put at client's disposal its resources. DMS here divides to two part – one dispose in client, another – in the server part of system. As the main interface between it's is used SQL – Language. That is why, the servers, involved in database structure, often named “SQL-servers”.

There are two-solution way of the interconnection between client and server on the base of SQL. The first include based in the idea, where all SQL-queries, performed by client, processed in the server's side. This method named “thick”. By another method, “thin”, all queries must be processed on the client's machine.

With regard to all program language support the object-oriented conception, it would be pertinent consider the databases according to it. Generally, in the common and classic position, object-oriented based on the next ideas:

- object and object's identifier;
- methods and attributes;
- classes;
- hierarchy and inheritance of classes.

Each object possessed by it's state (the set of values of it's attributes) and appointed to him behavior. Here as objects consider not only records (where the fields is a attributes), but a database too. Moreover, all operations by manipulating information, connecting to servers and etc. realized here with the methods and strategy of object-oriented programming.

All this low-level function encapsulated into special objected, what created in the environment. For example, there are visual component library (VCL) in the languages Borland Delphi, Borland C++ and the components with manipulating with the tables and databases (Data Access and Data Control) present among them. All this components, formats and filters, prescribed in the Delphi's internal code, named Borland DataBase Engine (BDE) [11]. BDE use inside in his body the Integrated Database Application Programmer Interface (IDAPI) – technology. The goal of the creation BDE/IDAPI technology was follow (see figure 1):

- attempt to unification of processing with different databases formats (Paradox, dBase and etc.);
- make PC to instrument of data's integration;
- direct access instead of import/export operations;
- unification of access to personal and SQL-server's databases;
- BDE – interface must be extendable in the future;
- supporting of the national specify (date formats, code pages);

Above it, API must become universal instrument both for native and non-native formats of data. The first realization of this ideas released in the early 90-years of XX century.

BDE used the navigation method of access to datum, the moving of the cursor in both directions. BDE allows to users normalize (sort) records by any keys, use bookmark for fast finding of any place, edit or block (for preventing the changes) any record.

The conceptual structure of the BDE and its relations are shown below [12].

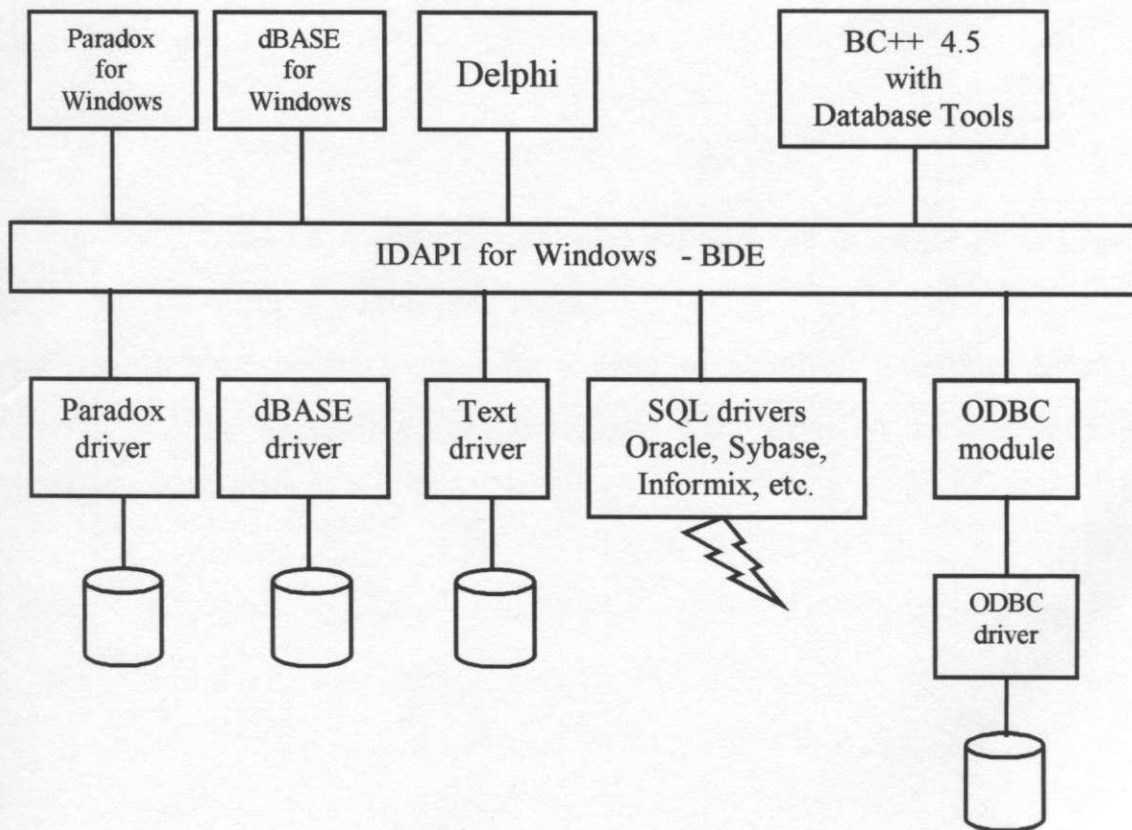


Figure 1.

Eventually, let's say some words about the stages of database's projecting.

- 1) Standing the task, analysis and determination of the global structure of the database. Detachment of the main function, what must DMS solve.
- 2) Determination of the table's field, it's type's, appointing the required (key) fields, confinement of the field's values
- 3) Creating the additional fields (calculated and lookup), bonding the tables through tied fields.
- 4) Writing the appropriate program code, what may perform operations with the tables (searching, filtering, editing, printing and etc.)
- 5) Debugging the program, detecting and correcting of the occurred errors.
- 6) Applying the programs and databases with real conditions, in the concrete machine.

The software must be able to provide main operations, appertaining to DMS, and counted below:

- representation;
- editing;
- searching;
- statistic.

The DMS must be multilanguage, and support the different code pages and best during depicting of contents of books.

Program must be performed on a base of standard graphical interface of Windows and be accessible for personnel, who have no special information knowledge's and skills.

## **2. The Standing of Problem**

Our purpose – build the AWP of libraries employee. This AWP must be able:

- store information about books, keeping in a library;
- store information about users of library;
- make the registration of a taking and returning a books;
- make the statistics about books using during certain time interval.

The DMS, what serve these databases, must integrate subsystems in a united system, take into account the relations between it. The apparent feature of our system – it's network supporting. One computer is selected as server – here will store the databases. Another computer used as clients – here users search and find the information's.

The software must be able to provide main operations, appertaining to DMS, and counted below:

- representation;
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The DMS must be multilanguage; and support the different code pages and fonts during depicting of contents of books.

Program must be performed on a base of standard graphical interface of Window's and be accessible for personnel, who have no special information knowledge's and skills.

**3.1 Creation and main way of solution of problem**

Let's consider the problem and terminate the main phases of its solution.

1. We must project the common structure of the system; and broke it to the subsystems.
2. Consider every one of subsystems separately and terminate of its arrangement.
3. Set the relations between subsystems. ( though the common fields ).
4. Adapt the software for network, terminate and confine the rights of access and control of the system.
5. Debug the systems; arrange the graphical interface between the user and program.

### **3.2 The window-structure of the program**

The interface of the program based on a standard-windows platform. User work with a lot of window (or a “forms”, as windows names in the Delphi environment). One form may be called from another by clicking on a button or by another action.

There are many components on each form. As already we have said, the components, in generally, is an expression, a realization of object – oriented method in programming. Every component have a properties, (and we may change and assign this properties), an events, (and we may intercept this events and assign to him the handles).

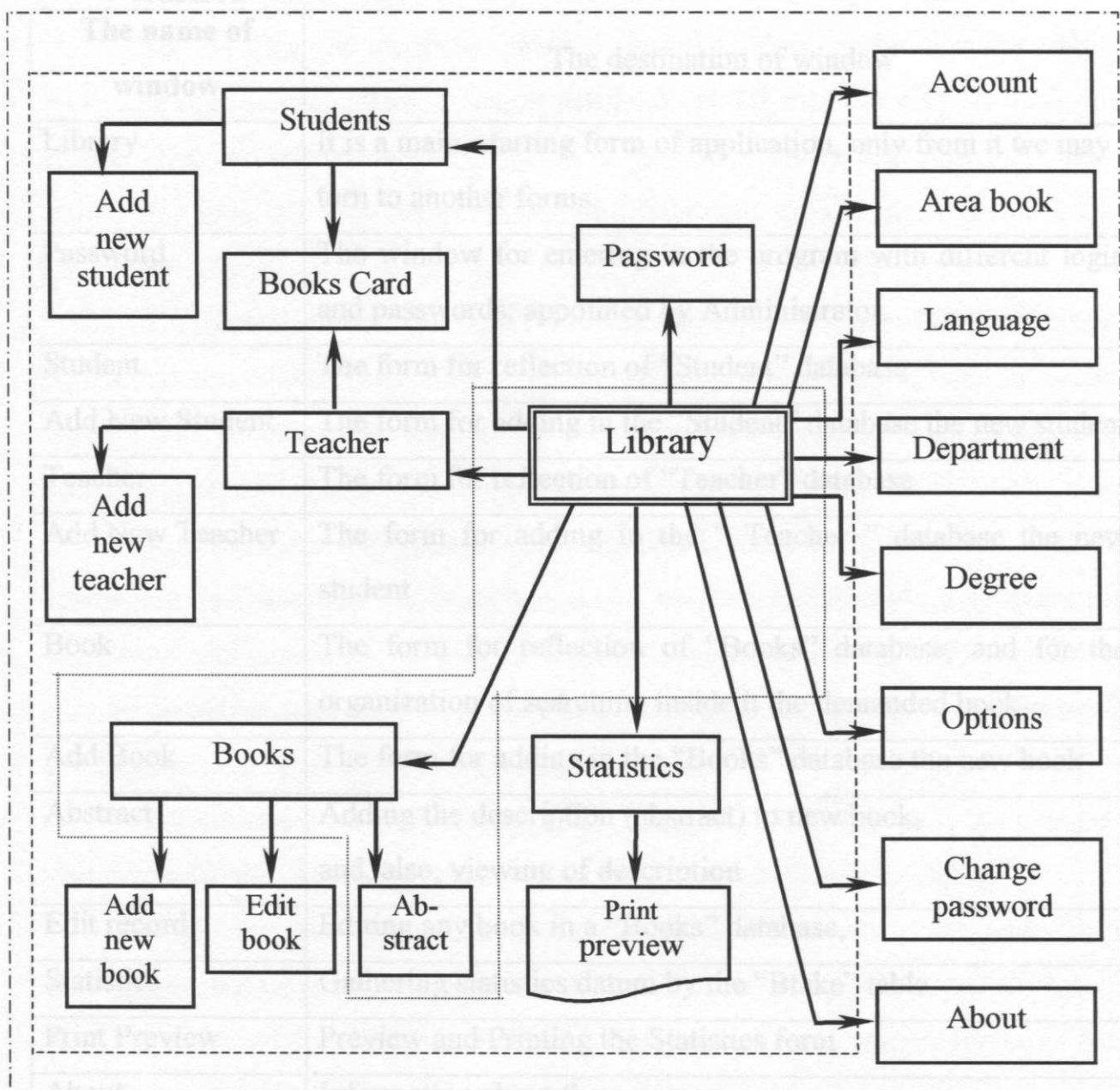
All components divide to visible and invisible in a stage of application’s running. Invisible components (as Ttable, Tdatabase, Ttimer and etc.). Allows to users interact with any resources in the computer: Table, Database, Time and another, or work with standard API-functions, for example, saving and Opening the Files.

The program may work in a few regimens, depend on the type of users: so, Student may only search necessary book; Elnur and Farhad may operate with the student’s records; Administrator may perform all operations in the application, he may assign new users and passwords, may manage with Netware (reassign the file-source of database). These divisions of the rights to different users by applying the system of passwords. So, such window in the program may be accessible for administration and be hidden from the simple students.

The window-structure of a program is shown in figure 2. Each of these windows will be considerate in follow chapters.



### 3.3 Description of windows



..... The coverage of Student

----- The coverage of Employees

-.-.-.- The coverage of Administrator

The figure 2. Window – structure of the program

### 3.3 Description of windows

Table1.

The name of window	The destination of window
Library	It is a main, starting form of application, only from it we may turn to another forms.
Password	The window for entering in the program with different login and passwords, appointed by Administrator.
Student	The form for reflection of "Student" database
Add New Student	The form for adding in the "Student" database the new student
Teacher	The form for reflection of "Teacher" database
Add New Teacher	The form for adding in the "Teacher" database the new student
Book	The form for reflection of "Books" database, and for the organization of searching inside it the demanded book
Add Book	The form for adding in the "Books" database the new book
Abstract	Adding the description (abstract) to new book, and, also, viewing of description
Edit record	Editing any book in a "Books" database,
Statistics	Gathering statistics datum by the "Btake" table
Print Preview	Preview and Printing the Statistics form
About	Information about the program
Password change	Changing the accepted passwords
Account	The list of registered users
Area Book	Editing the table "BookArea"
Language	Editing the table "Language"
Department	Editing the table "Departament"
Degree	Editing the table "Degree"
Options	Determine, do program run in the client or server mode
Book Card	Editing the table "Btake"

As we may see from the structure of the program, the different categories of users possessed by a different opportunities by the operating of the DMS.

So, the first, the most low category called Student, and it sign the simply user, who may search the book among the database. He may not edit the book and reader's list, and change any information in the tables, he work in regiment "read-only". For entering into the program with Student's rights, don't demand any password.

The second group of users – Library's employers presented in our example by Farhad and Elnur. They may regulate the table of readers, the table of books, operate with statistics. The log into the program by the name of anybody demands the special password, assigned to there personally by administrator.

Administrator may manipulate with all windows inside database, with all tables and database, and his main function – account to Library's employees the log names and password. He may delete employee from the list, forbid access for him by changing password, appoint a new employee, and change own password. All this operations performed in the database "Main".

Administrator also fulls the tables "Degree", "Department", "Language", and «Area Book». These options are gathered in the label 'Admin Tool'.

If the user can have access to any resources, it component still active, else this component take non-active mode and may not be used. So, the label 'Admin Tool' is active when work Administrator, and non-active, if Student, or Employee operates with DMS in the current moment.

The program provides the comfortable interface, the clarity of using. Sometimes, it even may correct the wrong actions of user, in a case of casual mistakes, or show a message with describing of an error's nature.

Program is able to ask any operations – perform or discard it – for example, the attempt to close the application lead to raising a window, with demanding to confirm the operation, or cancel it.

The option of printing realized in the program with a standard Delphi – component – Quick Report. This component allows to users preview the

information, print it with opportunity printing only the selected page (-s) – not all document entirely.

### 3.4 The database building

The first step of database building is the formalization and analyses of its structure. Here we will determinate the global plan of our work.

Let the pivotal table will be the table, where will store information about given and taken books from the library (the code of book, the code of person, who received the book), the date of return. Let we answer on the question: Why we used here the code of person and a book, instead of immediately name (surname) of person or title of book? There are some reasons here. Firstly, the name (and the title of book) may not absolutely guarantee, that in the database absent the person (or book) with such name – i.e. there is no providing of identification – and it may lead to misleading and mistakes both the DMS and the users. Secondly, if we should use the name, what, undoubtedly, more longer, that numeric type of code; a lot of records with using long words of string value, make our tables bulging and clumsy, upbringing in the tables redundancy difficultness.

In our cases, way that is more pertinent may be the method of tied fields. So, we will use any tables, and the field of one table (taken books) will be tied with field of another table (where described the names and the name's relations with identify code). The common field "code" will be unseen (hidden), we shall see the name (and applied information's in adjacent fields) instead code.

Below counted the name of tables and appointed to him function:

Table 2.

1. <b>Btake</b>	The table, sign, who and when have take the book, which book, and when somebody obliged to return the book and real time of returning.
2. <b>Books</b>	The code of book, its area (or sphere), title, author and brief other information about the book.

3. <b>Students</b>	Codes and names of student's -users of library.
4. <b>Teachers</b>	Codes and names of teacher's -users of library.
5. <b>Book area</b>	The list of divisions to which book may appertain.
6. <b>Department</b>	The list of departments in the university.
7. <b>Language</b>	The list of language by which was written the books.
8. <b>Degree</b>	The degree (status) of users.
9. <b>Main</b>	The tables of system passwords (accessible only for administrator). Have no direct relations with Database.

Below in detail described the specify of each table, and considerate the ties between fields:

### **3.5. Structure database and relations between them**

#### **3.5.1 The "Btake" table**

Table 3.

The fields	It's specification	Type	Types
Code	The identify code of person, who have take a book	Numerical	Student code Teacher code (incoming)
Book code	The code of taken book	Numerical	Books. Book code (incoming)
Date take	The date of take	Date	
Date return	The date of books return	Date	
Temporarily	The expected date of books return	Date	
The book has given			

### 3.5.2 The "Books" table

Table 4.	It's specification	Type	Types
The fields	It's specification	Type	Types
Book code	The code, what identify the number of a book	Numerical	Btake. Book code (out coming)
Book name	The title of book	String	
Book Author	The author of book	String	
Publisher	The publisher of a book	String	
Date of publication	The data of publication of a book	Date	
Area Code	The code of science area (what book about)	Numerical (invisible)	Book area Area Code (out coming)
Area	The books area of science (taken from the List)	String (calculated on the base of AreaCode)	Book area Area Name (out coming)
Language Code	The code of Language	Numerical	Language. Language code (incoming)
Language code	The name of Language (taken from the List)	String(calculated on the base of Language Code)	Language. Language (incoming)
Abstract	The brief describing of the contents of book	String	
Amount	The count of books having at presence in library today	Numerical	
Total	The common count of books in the library	Numerical	

### 3.5.3 The "Student" table

Table 5.

The fields	It's specification	Type	Types
Code	The identify code of student	Numerical	Btake. Code (out coming)
Name	The name of student	String	
Surname	The surname of student	String	
Patronymic	The patronymic of student	String	
Date of registration	The date of registration student in the library, as a readers	Date	
Phone	The personal telephone of students	Numerical	
Address	The home address of students	String	
IdDep.	The number of department	Numerical (invisible)	Department. IdDep. (incoming)
Department	The department where student is learning	String(calculated on the base of IdDep)	Department. Department (indirectly incoming)
Degree code	The code of existing science degree and students degree	Numerical (invisible)	Degree Degree code (incoming)
Degree	The degree (taken from the List)	String(calculated on the base of field Degree Code)	Degree. Degree (indirectly incoming)

### 3.5.4 The "Teacher" table

Table 6.

The fields	It's specification	Type	Types
Code	The identify code of teacher	Numerical	Btake. Code (out coming)
Name	The name of teacher	String	
Surname	The surname of teacher	String	
Patronymic	The patronymic of teacher	String	
Date of registration	The date of registration teacher in the library, as a readers	Date	
Phone	The personal telephone of teachers	Numerical	
Address	The home address of teachers	String	
IdDep.	The number of department	Numerical (invisible)	Department. IdDep. (incoming)
Department	The department where teacher is teaching	String(calculated on the base of IdDep)	Department. Department (indirectly incoming)
Degree code	The code of existing science degree	Numerical (invisible)	Degree Degree code (incoming)
Degree	The degree (taken from the List)	String(calculated on the base of field Degree Code)	Degree. Degree (indirectly incoming)



### 3.5.5 The table "Book Area"

Table 7.

The fields	It's specification	Type	Types
Area code	The code of the "subject" of book	Numerical	Books Book Code (out coming)
Area name	Here contain the list of sphere of books	String	Books. Area (indirectly out coming)

### 3.5.6 The table "Department"

Table 8.

The fields	It's specification	Type	Types
Department code	The code of department.	Numerical	Departments. Department code (out coming)
Name	The list of departments.	String	Departments. Department (indirectly out coming)

### 3.5.7 The table "Language"

Table 9.

The fields	It's specification	Type	Types
Language code	The code of language which books written in.	Numerical	Books Language code (out coming)
Language.	The list of language.	String	Book. Language. (indirectly out coming)

### 3.5.8 The table "Degree"

Table 10. Language) and Language (fields Language Code and Language).

The fields	It's specification	Type	Types
Degree code	The code of readers degree.	Numerical	Teacher. Degree code Student. Degree code (out coming)
Degree	The list of existing scientific and student degrees.	String	Teacher. Degree Student. Degree (indirectly out coming)

### 3.5.9 The table "Main"

Table 11. the number of Language, declared in the table "Language" But, in the

The fields	It's specification	Type	Types
Password	The password's of users	String	
Name	The names of users with different rights.	String	

Now, when we are aware about the internal structure of tables and about the structure of the database in general, we may, for example, explain the main technologies, applied here.

There of so notion is the term "lookup field".

We will consider the interactions between two tables: Books (fields Language Code and Language) and Language (fields Language Code and Language).

The table “Language” filled separately. We simply write the language and assign to it the language. For example,

“Language” Table

Table 12.

Language Code	“Language”
001	AZERBAIJAN
002	ENGLISH
003	RUSSIAN
004	GERMAN

The table “Books”, strictly speaking, has no field “Language” physically – if we should analyse its internal structure in the Database Desktop – (the Borland Delphi’s utility by arranging and designing of databases), we shall not see it. – This field is absent in the table “Books”.

In the structure of table “Books” present only the field “Language Code”. This field signifies the number of Language, declared in the table “Language”. But, on the other side, it is not important information for user – the number of language- it may only mislead him, and that is why the field “Language Code” in the “Books” table must be hidden.

It would be very comfortable for users if instead of strange field code user would see immediately the name language (Azerbaijan, English etc). So mechanisms are foreseen in Delphi. Firstly, we may write the program code, the core of which consists in follow:

1). The program (DMS) take from the table “Books” value of field (Language Code).

2). DMS open the table “Language” and begin to search this value inside the field “Language Code”.

3). If this value finding, DMS look, which name of Language (the field “Language”) corresponding to this code, i.e. present in the such record, DMS take this value.

4). DMS represent this value in the form of Delphi, where are shown the contents of table “Books”.

But this method has one substantial shortcoming – we may not reassign the language in the table “Books”. There is present more enhanced method. Below are it’s short describing:

1). We create during the designing of forms Delphi the additional field for table “Books” – lookup field (Language Code).

2). We appoint the key field – in our case it is the field “Language Code” in the table “Books”.

3). Here we must appoint to this field: the “lookup dataset” (i.e. the table “Language”).

4). In the “lookup dataset” we determine the field that will be tied to the field “Language Code” in the table “Books”. It will be the field “Language Code” in “Language” table. Of course, the type of tied fields must be identical.

5). Lookup Result Field determines the field, what must depict in the new field (in the Books. Language). In our case, it will be field “Language” Language.

The type of these fields must be identical too.

### 3.6 The conceptual scheme of “Lookup” relations between tables

The dashed field, represented on the figure 3 is the “Lookup” field, physically not presented in the table “Books”.

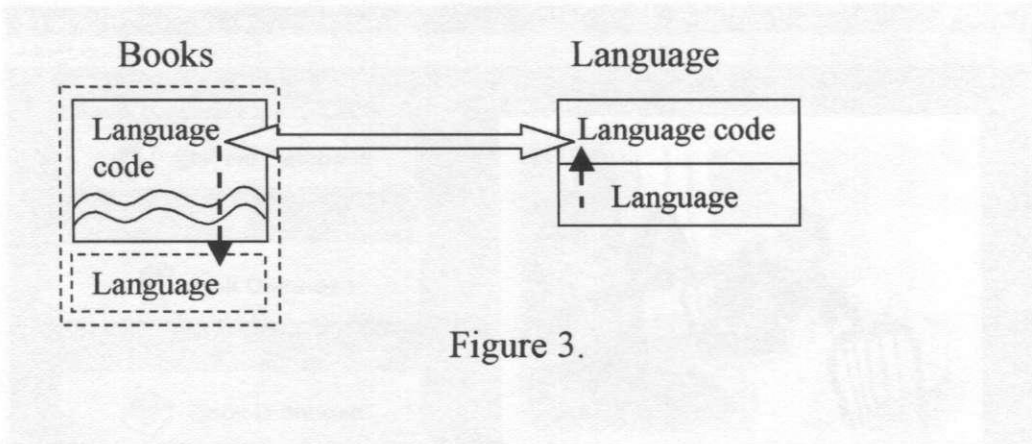


Figure 3.

The fields “Language Code” in the tables “Books” and “Language” serve as a port; through it the field “Language” in the table “Books” take the data from the field “Language” in the table “Language”.

The information inside the “Language” table still constant even if we reassign the language for any book.

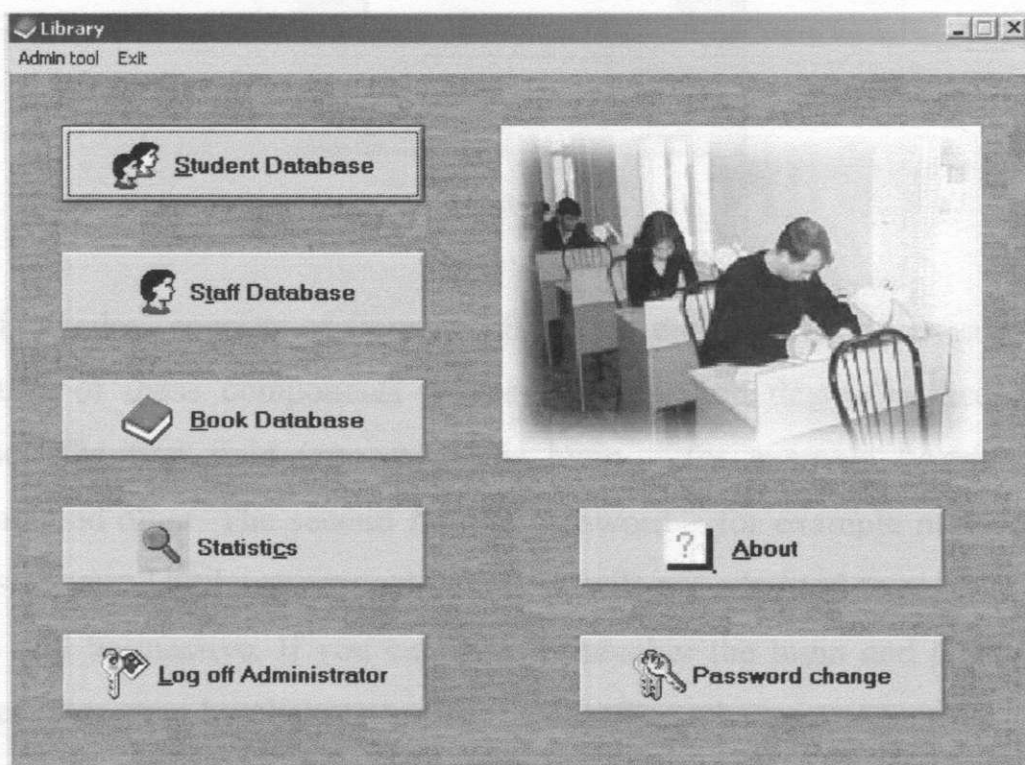
The advantage of this method consist in the fact, that all it realization work with any program code – it is sufficiently for us only configure the options in the tables “Books” and “Language” and it’s fields. It is a good evidence of flexibility of BDE - / component method, used in Delphi.

“Statistics”, “Log off administrator”, “Password change” and “About”. Moreover, at the left upper part of window we can see secondary (but very important) button “Admin tool”. If you click “Student database” we can see the window “Student”, if you click “Staff database” we can see the window “Staff” etc.

It is necessary to note that if you release the “LIBRARY” program start, at the same time with the “Library” window we can see the “Password” window (Pic. 2)

#### 4. Application “LIBRARY” program

At the “LIBRARY” program start, we can see the window “Library”.



Picture 1.

The principal part of this window is a main menu, consisting from the seven primary buttons: “Student database”, “Staff database”, “Book database”, “Statistics”, “Log off administrator”, “Password change” and “About”. Moreover, at the left upper part of window we can see secondary (but very important) button “Admin tool”. If you click “Student database” we can see the window “Student”, if you click “Staff database” we can see the window “Staff” etc.

It is necessary to note that if you release the “LIBRARY” program start, at the same time with the “Library” window we can see the “Password” window (Pic. 2).



Picture 2.

This window consists of from two fields for entering the string valuates. The destination of these components means determination degree of access to the database. The first field (upper) means login – for example “Administrator”, “Student” and other. The second field is password – for example number 11 (for administrator). Until you entered password will not admitted to main menu – all buttons will be inactive. If you cannot to remember the login and password, you can to exit program by clicking button “Escape” or otherwise if you want to enter in program you must appeal to administrator.

The detail description of work of this window you will find below.

If you entered to main menu and click the button “Student Database” you can see the window “Student”.

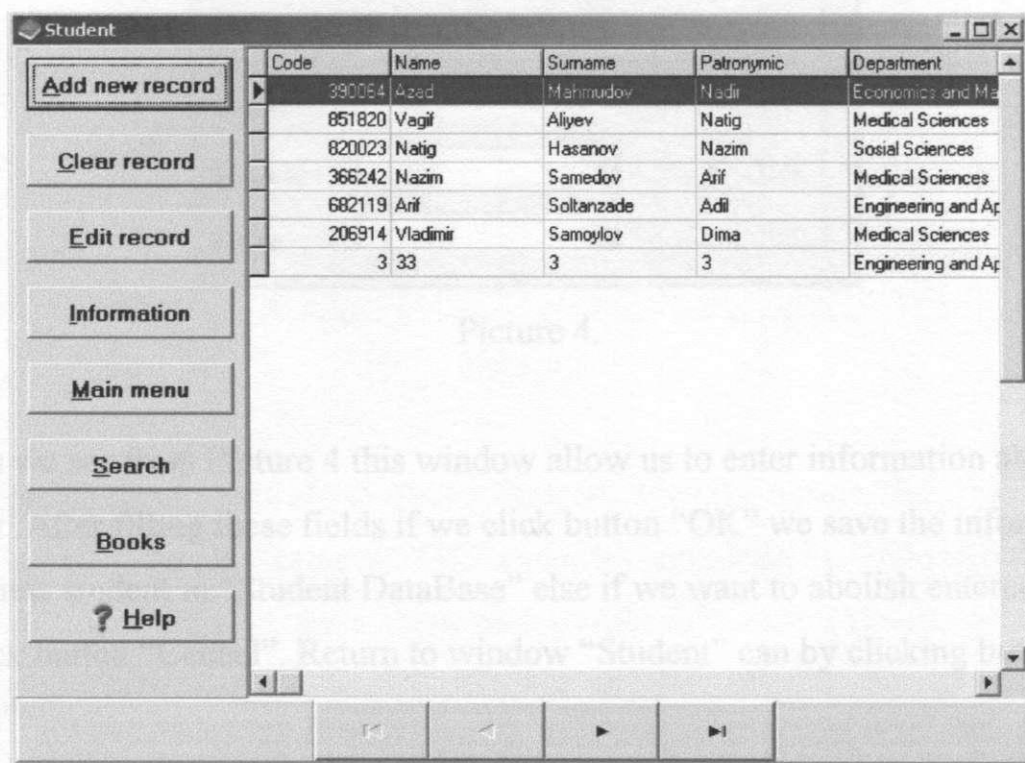
In the left part of window, we may observe the special panel with buttons. Every of this buttons have it's destination, and clicking on every of it evoke any actions. In the right part of window, we may see the grid – the Delphi – component for reflecting of database. In the grid, we may observe the vertical column – this is a field of table “Student”. The horizontal rows – is a records of this database. The state of a grid by default – read only.

The printing to a button «ADD NEW RECORD» evokes the appearing another window “ADD NEW STUDENT” (Picture 4). He appends a new record to existing database “Student”.

## 4.1 The “Student” window

If you entered to main menu and click the button “Student Database” you can see the window “Student”.

Here are represented the window “Student” (Picture 3.).



Picture 3.

In the left part of window, we may observe the special panel with buttons. Every of this buttons have it's destination, and clicking on every of it evoke any actions. In the right part of window, we may see the grid – the Delphi – component for reflecting of database. In the grid, we may observe the vertical column – this is a field of table “Student”. The horizontal rows – is a records of this database. The state of a grid by default – read only.

The printing to a button «ADD NEW RECORD» evokes the appearing another window “ADD NEW STUDENT” (Picture 4). He appends a new record to existing database “Student”.



Picture 4.

As we see from Picture 4 this window allow us to enter information about new student. After filling these fields if we click button “OK” we save the information about new student in “Student DataBase” else if we want to abolish entered data we click button “Cancel”. Return to window “Student” can by clicking button “Close”.

The button “CLEAR” record deletes the record from database, but before it, the user will see on a screen the window, with the risk, do he want really delete it. If he will press YES, the confirmation of deleting will be accepted, and the record will be deleted, else the action will be cancelled.

But if we click the button “EDIT RECORDS” in the left panel, grid will take an editable state only for selected row. Now we may click on any cell in selected row of the grid and change it. If we by accident click the other row we can see that the grid state read only.

When we click the button “Information”, we immediately see the window “Information” in which gives the full information about selected student-users (Picture 5).

The screenshot shows a dialog box titled "Information" with a close button (X) in the top right corner. The dialog contains the following fields and controls:

- Code: 390064
- Name: Azad
- Surname: Mahmudov
- Patronymic: Nadir
- Date of reg: 14.06.2002
- Phone: 322905
- Address: (empty)
- Department: Economics and Managemt (dropdown menu)
- Degree: BS (dropdown menu)
- Buttons: Edit, Add, Clear, Cancel, Close (with a small icon)
- Navigation arrows: Home, Previous, Next, End

Picture 5.

If you to correct data about student-user we click the button “Edit”, which immediately change her name to “OK” and after correcting by clicking button “OK” we save this information about student-user in “Student DataBase” else if we want to abolish entered data we click button “Cancel”.

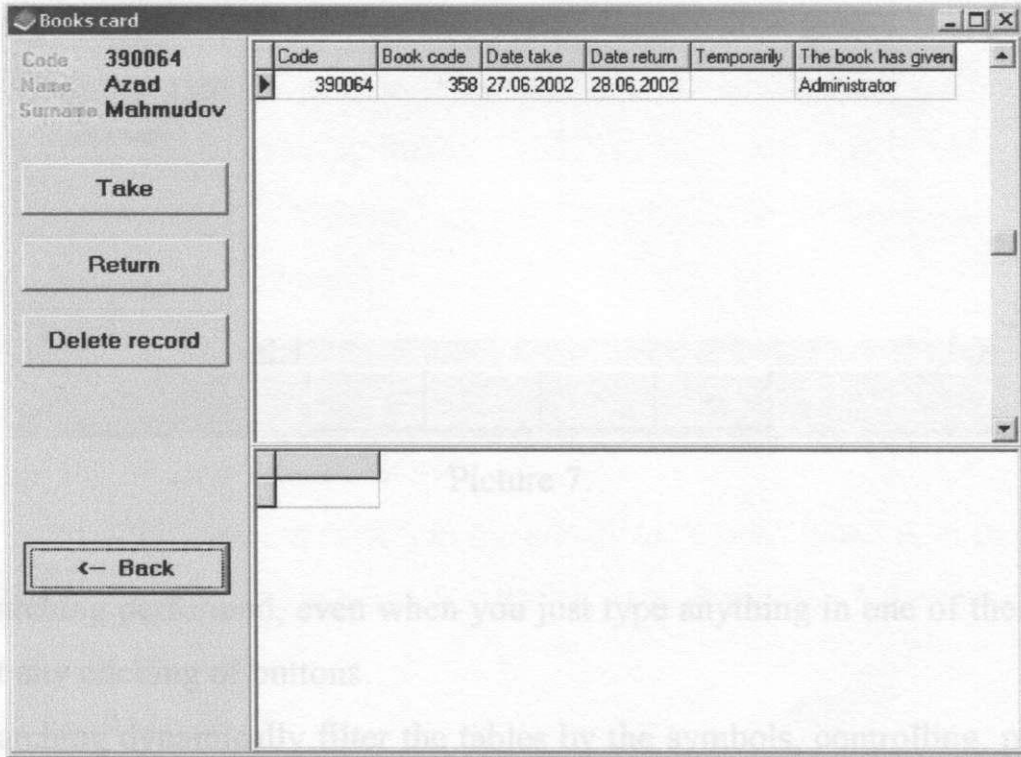
If you want to enter a new student-user, you must to click button “Add”. The button “Add” change on the button “OK”. After filling these fields if we click button “OK” we save this information about new student-user in “Student DataBase” else if we want to abolish entered data we click button “Cancel”.

The button “CLEAR” record deletes the record from database, but before it, the user will see on a screen the window, with the risk, do he want really delete it. If he will press YES, the confirmation of deleting will be accepted, and the record will be deleted, else the action will be cancelled.

Return to window “Student” can by clicking button “Close”.

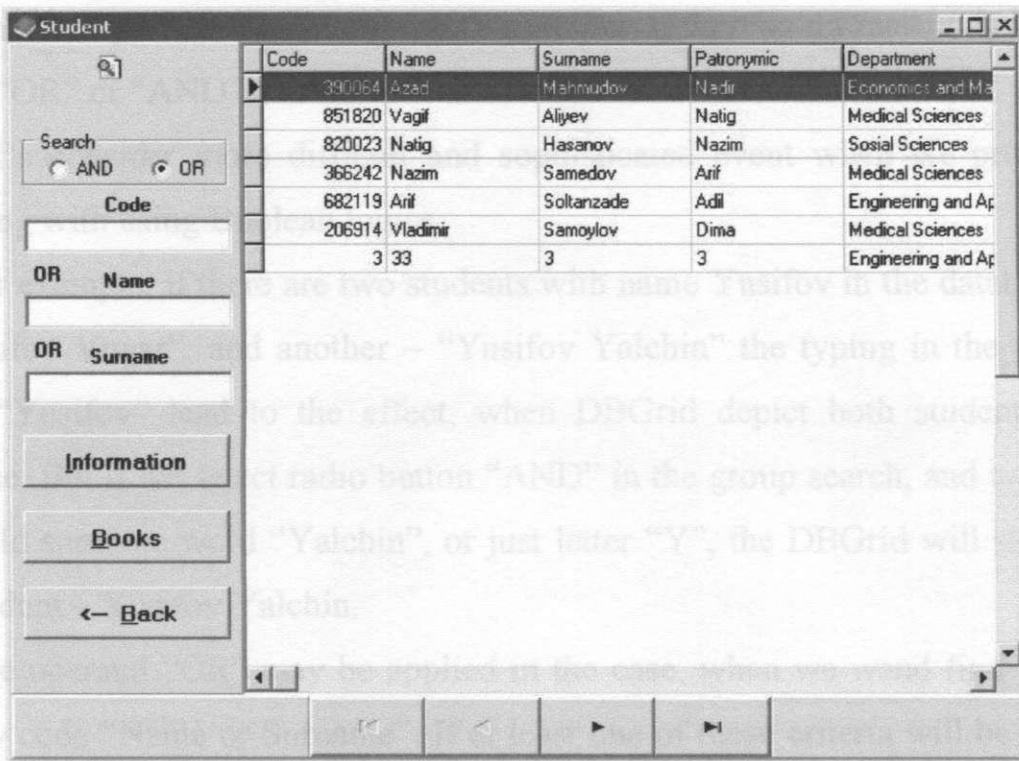
If you want to return in main menu we must to click the button “Main menu”.

If you click the “BOOKS” button there will be a window “Books card” (Picture 6) where will be shown information from “Btake” table, but only regard with that reader, (student), who was active in the “Students” database. The detail descriptions of this window see below.



Picture 6.

The button “SEARCH” transforms a panel to another mode (Picture 7). There are appear radio buttons and the fields for entering the string valuates. The destination of these components – the organization of searching the data in the database. The searching may be performed by the code, by the name, and by the surname with using with it’s – applied the logical operands (“And” and “Or”) between there.



Picture 7.

Searching performed, even when you just type anything in one of these fields, without any clicking of buttons.

Searching dynamically filter the tables by the symbols, controlling, present or not the typed symbols in the fields.

If we typed "A" in the edit field "Name", DMS will image us a records, where presented first symbol "A". For example: Abasov, Agayev, Aydanov, Aliyev, Alibeyli, Ashurov.

If we add the letter "I" to "A" ("AI"), the program will give us the list of students, which names begin from "AI". For example: Aliyev, Alibeyli, Aliyarov.

The combination of letters "Ali" will give such results;

If we type "Aliy", we shall see only "Aliyev" in our grid.

If will be typed combination of symbols, absented in database, for example "Alm" the DMS show the empty grid.

Another edit-field, presented in the panel, ("Code" or "Surname") organized in the same manner.

When we perform searching by single criteria, there is no matter, is the radio button “OR” or “AND” actives.

Let’s consider more difficult and sophisticated event when we process the searching with using Boolean logics.

For example, if there are two students with name Yusifov in the database; first – “Yusifov Vugar”, and another – “Yusifov Yalchin” the typing in the field-edit string “Yusifov” lead to the effect, when DBGrid depict both students in the database. But if we select radio button “AND” in the group search, and type in the edit-field surname word “Yalchin”, or just letter “Y”, the DBGrid will show only one student – Yusifov Yalchin.

The operand “OR” may be applied in the case, when we want find students, both by code “Name or Surname”. If at least one of these criteria will be fulfilled, the record will be shown in a DBGrid.

If, (with using operand “OR”) in the edit-field “Code” typed 8, in the “Name” typed S, and in the Surname typed V, DBGrid may depict the follow students (see Table 13):

Table 13.

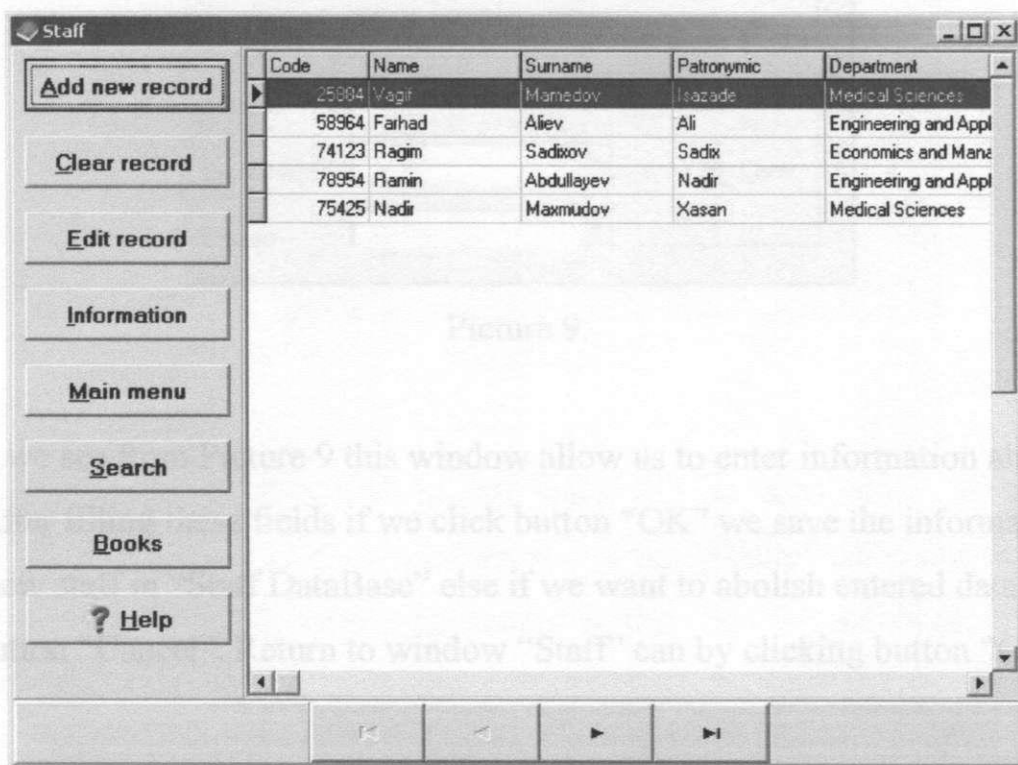
Code	Name	Surname
390064	Mahmudov	Vugar
851820	Aliyev	Vagif
820023	Hasanov	Natig
366242	Samedov	Nazim
682119	Soltanzade	Arif
206914	Samoylov	Vladimir

The button “BOOKS” throw user to a window “Book card”, and button “BACK” return to a first panel, what allows to edit the database.

## 4.2 The “Staff” window

If you entered to main menu and click the button “Staff Database” you can see the window “Staff”.

Here are represented the window “Staff” (Picture 8.).



Picture 8.

In the left part of window, we may observe the special panel with buttons. Every of this buttons have it's destination, and clicking on every of it evoke any actions. In the right part of window, we may see the grid – the Delphi – component for reflecting of database. In the grid, we may observe the vertical column – this is a field of table “Staff”. The horizontal rows – is a records of this database. The state of a grid by default – read only, i.e. we may not edit the records. The printing to a button “ADD NEW RECORD” evokes the appearing another window “ADD NEW STAFF”, what described later. He appends a new record to existing database “Staff” (Picture 9).

Picture 9.

As we see from Picture 9 this window allow us to enter information about new staff. After filling these fields if we click button “OK” we save the information about new staff in “Staff DataBase” else if we want to abolish entered data we click button “Cancel”. Return to window “Staff” can by clicking button “Close”.

The button “CLEAR” record deletes the record from database, but before it, the user will see on a screen the window, with the risk, do he want really delete it. If he will press YES, the confirmation of deleting will be accepted, and the record will be deleted, else the action will be cancelled.

But if we click the button “EDIT RECORDS” in the left panel, grid will take an editable state only for selected row. Now we may click on any cell in selected row of the grid and change it. If we by accident click the other row, we can see that the grid state read only.

When we click the button “Information”, we immediately see the window “Information” in which gives the full information about selected staff-users (Picture 10).

The screenshot shows a window titled "Information" with the following fields and values:

- Code: 390064
- Name: Azad
- Surname: Mahmudov
- Patronymic: Nadir
- Date of reg: 14.06.2002
- Phone: 322905
- Address: -
- Department: Economics and Managment
- Degree: BS

Buttons on the right side: Edit, Add, Clear, Cancel, Close.

Navigation arrows at the bottom: Home, Previous, Next, End.

Picture 10.

If you click the "BOOKS" button there will be a window "Books card" (Picture 11.) where will be shown information from "Btake" table, but only regard with that reader, (staff), who was active in the "Staffs" database. The detail descriptions of this window see below.

The screenshot shows a window titled "Books card" with the following data:

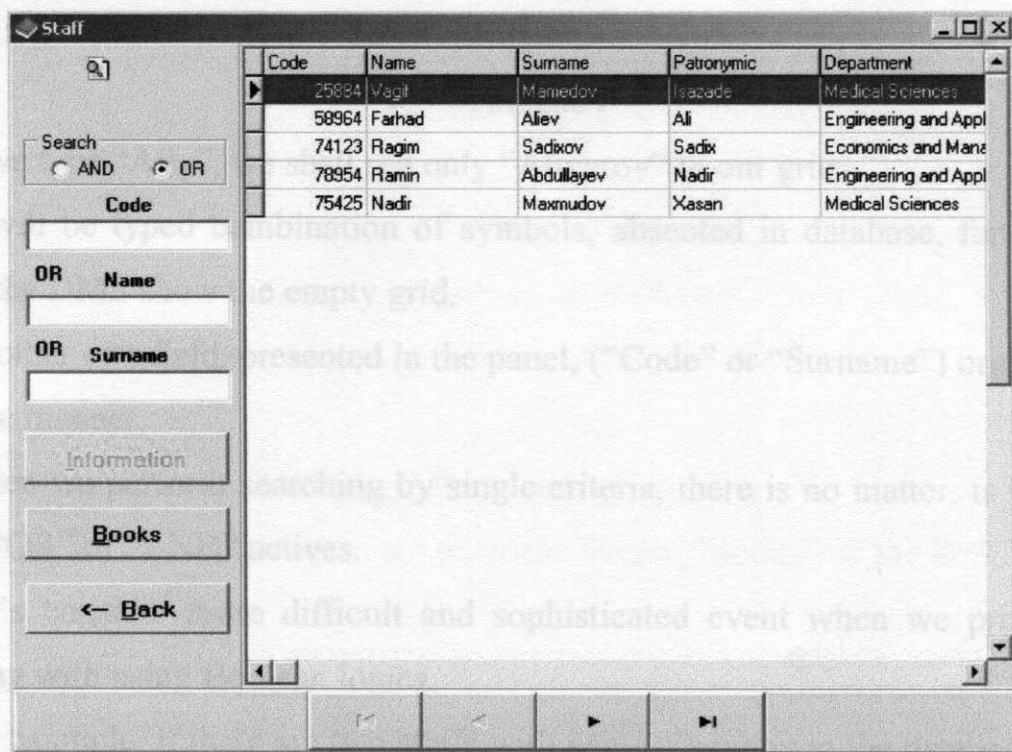
Code	Book code	Date take	Date return	Temporarily	The book has given
390064	358	27.06.2002	28.06.2002		Administrator

Buttons on the left side: Take, Return, Delete record, ← Back.

Picture 11.



The button “SEARCH” transforms a panel to another mode (Picture 12). There are appear radio buttons and the fields for entering the string valuates. The destination of these components – the organization of searching the data in the database. The searching may be performed by the code, by the name, and by the surname with using with it’s – applied the logical operands (“And” and “Or”) between there.



Picture 12.

Searching performed, even when you just type anything in one of these fields, without any clicking of buttons.

Searching dynamically filter the tables by the symbols, controlling, present or not the typed symbols in the fields.

If we typed “A” in the edit field “Name”, DMS will image us a records, where presented first symbol “A”. For example, Abdinov

Agasiyev

Aydamirov

Aliyarov

Alibekov

Alhasov

If we add the letter “I” to “A” (“AI”), the program will give us the list of staffs, which names begin from “AI”. For example, Aliyarov

398054	Mansurov	Alibekov
851820	Alibekov	Alhasov

The combination of letters “Ali” will give such results. The program will give us

366242	Samedov	Nazim
682119	Sultimov	Aliyarov Akif
206914	Steklov	Alibekov Viktor

If we type “Aliy”, we shall see only “Aliyarov” in our grid.

If will be typed combination of symbols, absented in database, for example “Alm” the DMS show the empty grid.

Another edit-field, presented in the panel, (“Code” or “Surname”) organized in the same manner.

When we perform searching by single criteria, there is no matter, is the radio button “OR” or “AND” actives.

Let’s consider more difficult and sophisticated event when we process the searching with using Boolean logics.

For example, if there are two staffs with name Yagubov in the database; first – “Yagubov Vasim”, and another – “Yagubov Yashar” the typing in the field-edit string “Yagubov” lead to the effect, when DBGrid depict both staff in the database. But if we select radio button “AND” in the group search, and type in the edit-field surname word “Yashar”, or just letter “Y”, the DBGrid will show only one staff – Yagubov Yashar.

The operand “OR” may be applied in the case, when we wand find staffs, both by code “Name or Surname”. If at least one of these criteria will be fulfilled, the record will be shown in a DBGrid.

If, (with using operand “OR”) in the edit-field “Code” typed 8, in the “Name” typed S , and in the Surname typed V, DBGrid may depict the follow staffs (see Table 14):

Picture 13.

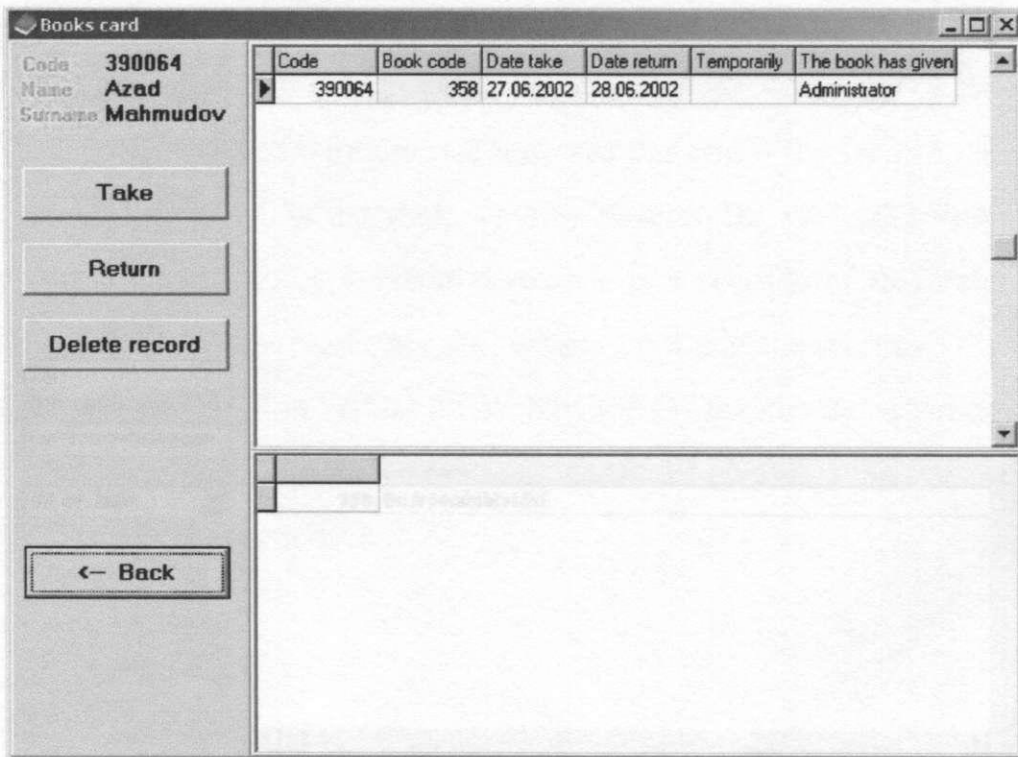
Table 14.

Code	Name	Surname
390064	Mamedov	Vasim
851820	Alibekov	Veli
820023	Hasanli	Nadir
366242	Samedov	Nazim
682119	Sultanov	Akif
206914	Steklov	Viktor

The button "BOOKS" throw user to a window "Books card", and button "BACK" return to a first panel, what allows editing the database.

#### 4.2.1 The "Books card" window

This window appears when we click the button "Books" in the both windows "Students" and "Staffs".



Picture 13.

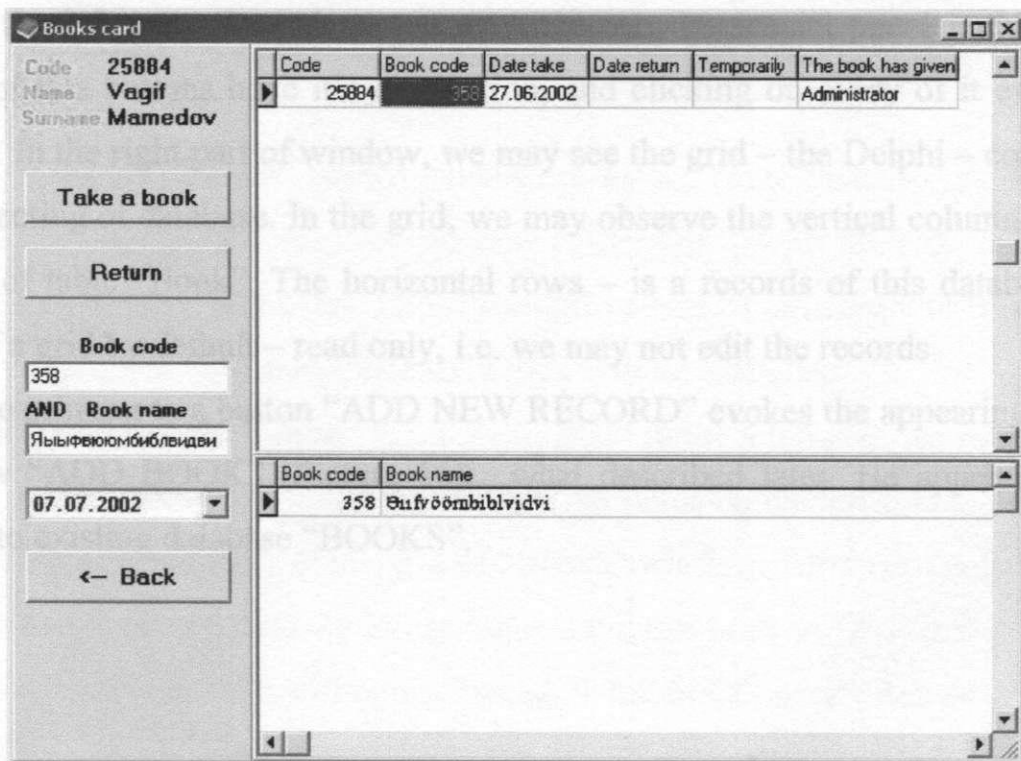
In the left part of window we can see the panel which reflect code, name and surname of users (student or staff). Below four buttons are placed (see Picture 13).

In the right part of window we can see two grid: upper grid give us information about activity given student or staff in library (Who? What? When?), the lower grid give us a full information about given book (Book code, book name, book author, Publisher, Date of publication, Area, Amount, Language, Total).

When we click the button “Take” we can see (Picture 14) that the left part of window transforms to panel reflecting the data about the book (Code or name of book ), which we want to take from library. In the case of receiving of book clicking the button “Take a book” in upper part of grid appears the record about taking the book. For return the taking book we at first must to click the button “Take” and after selecting the returning book from upper part of grid we click the button “Return”.

The button “Delete record” is necessary for deleting the record about book that returned in library.

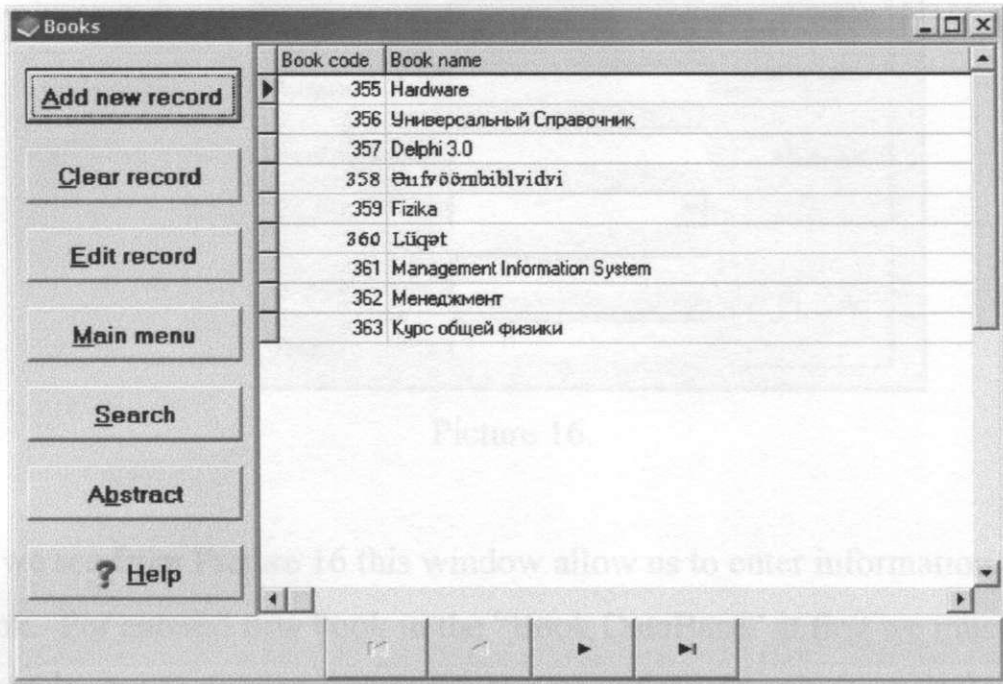
The button “Back” return us to the windows “Student” or “Staff”.



Picture 14.

### 4.3 The “Books” window

Here are represented the window “Books” (Picture 15).



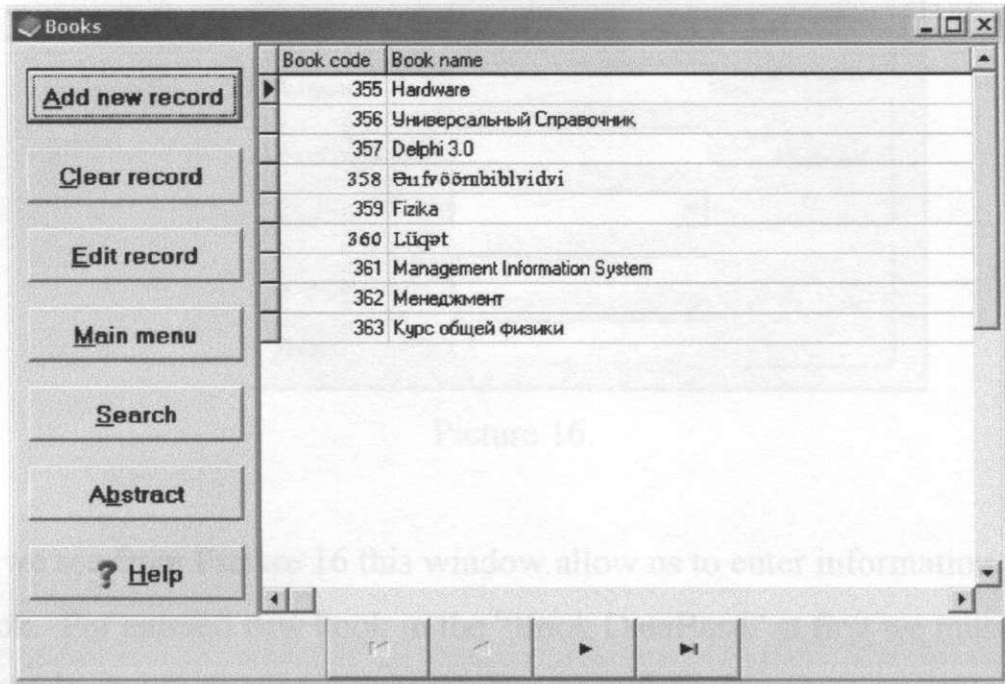
Picture 15.

In the left part of window, we may observe the special panel with buttons. Every of this buttons have it's destination, and clicking on every of it evoke any actions. In the right part of window, we may see the grid – the Delphi – component for reflecting of database. In the grid, we may observe the vertical column – this is a field of table “Book”. The horizontal rows – is a records of this database. The state of a grid by default – read only, i.e. we may not edit the records.

The printing to a button “ADD NEW RECORD” evokes the appearing another window “ADD BOOK” (Picture 16) , what described later. He appends a new record to existing database “BOOKS”.

### 4.3 The “Books” window

Here are represented the window “Books” (Picture 15).



Picture 15.

In the left part of window, we may observe the special panel with buttons. Every of this buttons have it's destination, and clicking on every of it evoke any actions. In the right part of window, we may see the grid – the Delphi – component for reflecting of database. In the grid, we may observe the vertical column – this is a field of table “Book”. The horizontal rows – is a records of this database. The state of a grid by default – read only, i.e. we may not edit the records.

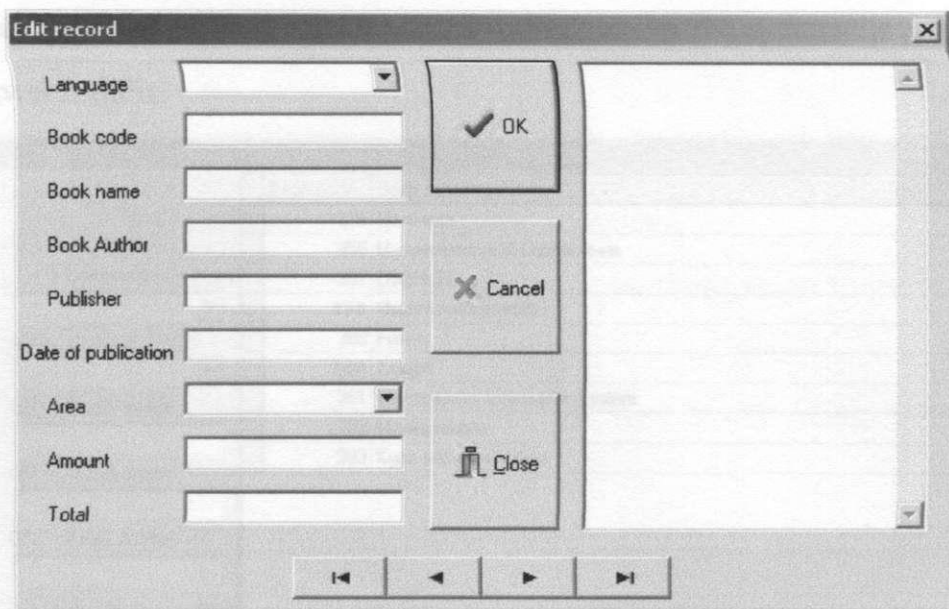
The printing to a button “ADD NEW RECORD” evokes the appearing another window “ADD BOOK” (Picture 16) , what described later. He appends a new record to existing database “BOOKS”.

Picture 16.

As we see from Picture 16 this window allow us to enter information about new book. For entered new book in the “Book DataBase” at first we must to choose the language of book, otherwise the other fields are inactive. After filling these fields if we click button “OK” we save the information about new book in “Books DataBase” else if we want to abolish entered data we click button “Cancel”. Return to window “Books” can by clicking button “Close”.

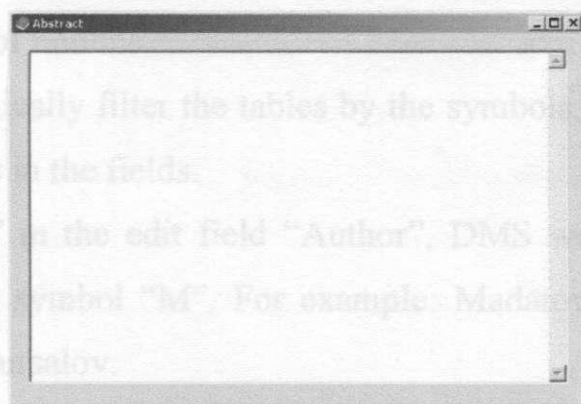
The button “CLEAR” record deletes the record from database, but before it, the user will see on a screen the window “Attention”, with the risk, do he want really delete it. If he will press YES, the confirmation of deleting will be accepted, and the record will be deleted, else the action will be cancelled.

But if we click the button “EDIT RECORD” in the left panel, we can see the new window “Edit record” (see Picture 17). All fields on the left side will be filled data, which selected early in the grid of “Books” window. After editing data if we click button “OK” we save the information about this book in “Books DataBase” else if we want to abolish editing data we click button “Cancel”. Return to window “Books” can by clicking button “Close”.



Picture 17.

If you click the “ABSTRACT” button there will be a window “ABSTRACT” (Picture 18) where will be shown information about contents of books, but only regard with that book, what was active in the “BOOK” database.

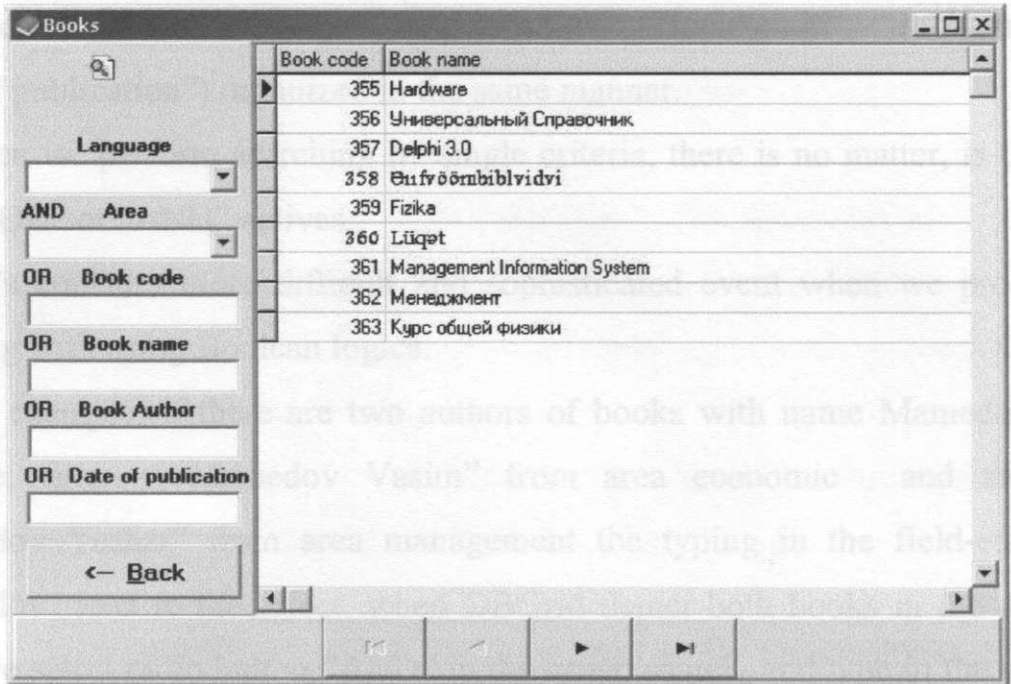


Picture 18.

The button “SEARCH” transforms a panel to another mode (Picture 19). There are appear radio buttons and the fields for entering the string valuates. The destination of these components – the organization of searching the data in the database. The searching of books may be performed by the book code, by the book name, by the book author and by the date of publication with using with it’s – applied the logical operands (“And” and “Or”). It is necessary to point out that before performing information about code, name, author etc. we must to provide



data about language and area of book by introduction these data in corresponding fields between their.



Picture 19.

Searching performed, even when you just type anything in one of these fields, without any clicking of buttons.

Searching dynamically filter the tables by the symbols, controlling, present or not the typed symbols in the fields.

If we typed "M" in the edit field "Author", DMS will image us a records, where presented first symbol "M". For example: Madatov, Maksimov, Makakin Mitchel, Muradov, Mursalov.

If we add the letter "a" to "M" ("Ma"), the program will give us the list of books, which author names begin from "Ma". For example, Madatov

390064	Fizika	Veliev	Maksimov
851820	Economic	Vasm	Makakin

The combination of letters "Mak" will give such results. The program will give us

856242	Windows2000	London	Maksimov
682119	Manag	Boach-Bogoyevich	Makakin
206914	Seminar	Vassiliou	

If we type "Maka", we shall see only "Makakin" in our grid.

If will be typed combination of symbols, absented in database, for example “Mal” the DMS show the empty grid.

Another edit-field, presented in the panel, (“Book code”, “Book name” or “Data of publication”) organized in the same manner.

When we perform searching by single criteria, there is no matter, is the radio button “OR” or “AND” actives.

Let’s consider more difficult and sophisticated event when we process the searching with using Boolean logics.

For example, if there are two authors of books with name Mamedov in the database; first – “Mamedov Vasim” from area economic , and another – “Mamedov Yashar” from area management the typing in the field-edit string “Mamedov” lead to the effect, when DBGrid depict both books in the database. But if we select radio button “AND” in the group search, and type in the edit-field area word “Economic”, or just letter “E”, the DBGrid will show only one book – Mamedov Vasim.

The operand “OR” may be applied in the case, when we wand find books, both by code “Book code, Book name, Book Author or Date of publication”. If at least one of these criteria will be fulfilled, the record will be shown in a DBGrid.

If, (with using operand “OR”) in the edit-field “Book code” typed 8, in the “Book name” typed S , and in the “Book Author” typed V, DBGrid may depict the follow books:

Table 15.

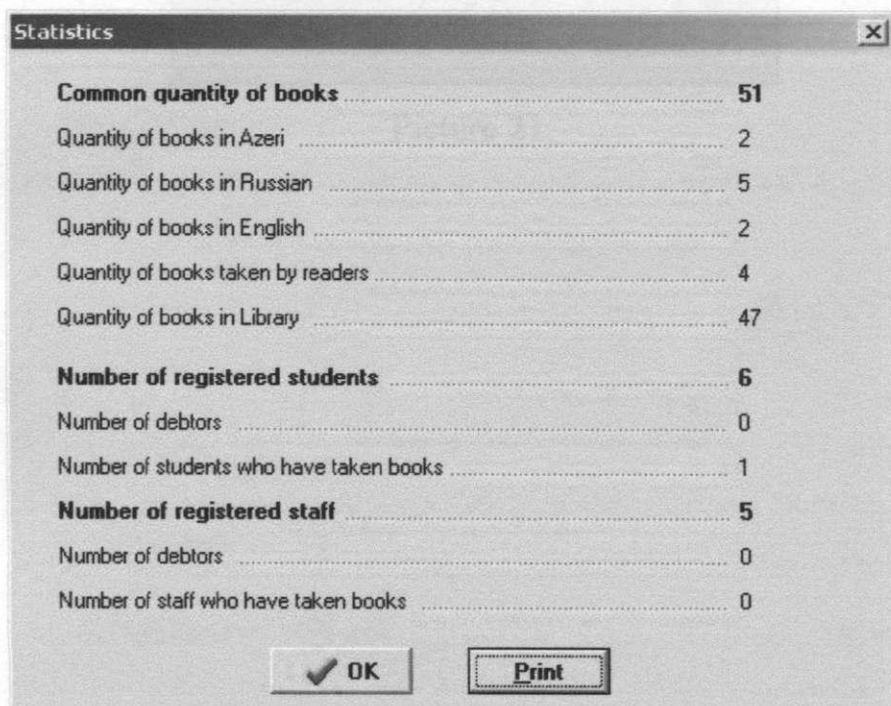
Book code	Book name	Book Author
390064	Fizika	Veliyev
851820	Economic	Vasin
820023	foundations	Geits
866242	Windows2000	Laudon
682119	Management	Bonch-Bruyevich
206914	Semiconductors	Vassiliou
	System Software	

The button “ABSTRACT” throw user to a window “ABSTRACT”, and button “BACK” return to a first panel, what allows editing the database.

#### 4.4 The “Statistics” window

Here are represented the window “Statistics”. The most part of window, we may see the DBLabel – the Delphi – component for reflecting of database. We may observe the horizontal rows – is a record about quantity of books on each language, number of registered students and staffs.

This window (Picture 20) provides us all necessary information about statistic data in library. These statistic data are including the follows:



Statistics	
<b>Common quantity of books</b> .....	<b>51</b>
Quantity of books in Azeri .....	2
Quantity of books in Russian .....	5
Quantity of books in English .....	2
Quantity of books taken by readers .....	4
Quantity of books in Library .....	47
<b>Number of registered students</b> .....	<b>6</b>
Number of debtors .....	0
Number of students who have taken books .....	1
<b>Number of registered staff</b> .....	<b>5</b>
Number of debtors .....	0
Number of staff who have taken books .....	0

At the bottom of the window, there are two buttons: "OK" and "Print".

Picture 20.

At the foot of window, we can see two buttons: “OK” and “PRINT”. The “OK” button usually use after acquaintance of information if you want to return in main menu. By clicking the button “Print” we may these data to bring on the “Print preview” window and after print.

#### 4.5 The “Password change” window

If user want to change his password without help of administrator he by clicking the “Password change” button on the main menu can to open the window “Password change” (Picture 21) and to full three fields.



The image shows a standard Windows-style dialog box titled "Password change". It contains three text input fields stacked vertically, labeled "Old password", "New password", and "Confirm password". At the bottom of the dialog is a single button labeled "OK" with a checkmark icon to its left. The dialog box has a close button (X) in the top right corner.

Picture 21.

The destination of these components means determination degree of access to the database. For example, if you in the first field typed "Student" we can see that only buttons "BOOK DATABASE", "Log of Student" and "ABOUT" are active.

If you are employees of library for access to main menu you must to introduce you login (usually name) and you password. In this case all buttons of main menu are active except "Admin tool" button, which placed on the upper part of main menu. At last, for administrator all buttons of main menu are active. Besides you discovery that for administrator become the active the important button on the upper part of main menu - button "Admin tool".

#### 4.6 The “Password” window

This window consists of from two fields for entering the string valuates (Picture 22).



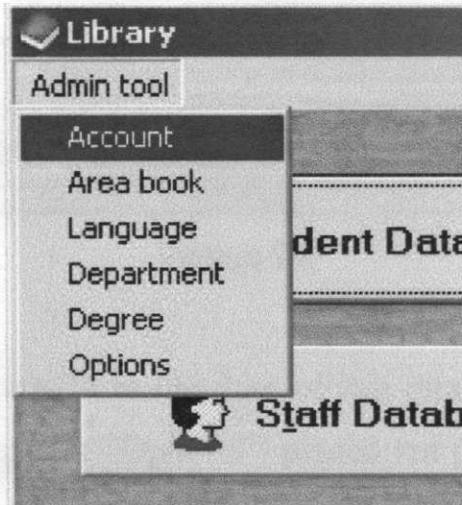
Picture 22.

The destination of these components means determination degree of access to the database. For example, if you in the first field typed “Student” we can see that only buttons “BOOK DATABASE”, “Log of Student” and “ABOUT” are active.

If you are employees of library for access to main menu you must to introduce you login (usually name) and you password. In this case all buttons of main menu are active except “Admin tool” button, which placed on the upper part of main menu. At last, for administrator all buttons of main menu are active. Besides you discovery that for administrator become the active the important button on the upper part of main menu - button “Admin tool”.

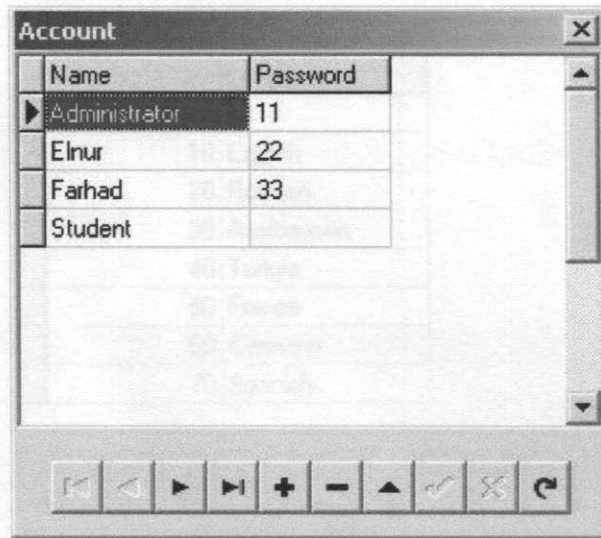
#### 4.7 “Admin tool”

The button “Admin tool” allows us get on the additional menu. This additional menu consists of from the next six buttons (Picture 23):



Picture 23.

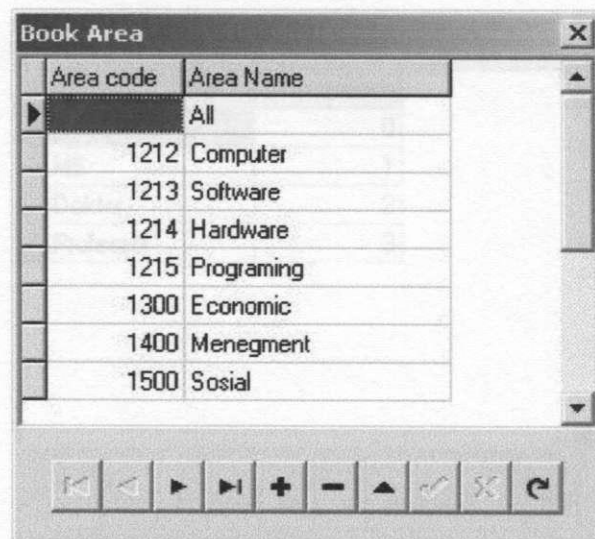
In the “Account” window (Picture 24) we can to show the table consisting from two vertical columns: “Name” and “Password”. In this window enumerated all login and passwords all users and employees of library, who have the access to database of library. Administrator can to change any login and password due to this window. The horizontal rows – is a records of login (“Name”) and password database. If you cannot to remember our login and password, you can to address to administrator and he by this window can remind to you your login and password and if necessary to change their.



Picture 24.

As you see from Picture 24 in the drag of this picture (and analogical in five windows “Admin Tool” except “Options”) placed ten (10) button every of which means by way of following from left to right the next: “First record”, “Prior record”, “Next record”, “Last record”, “Insert record”, “Delete record”, “Edit record”, “Post edit”, “Cancel edit”, “Refresh data”. It is necessary to note that if you lay the mouse on the button but not click her can immediately to see the corresponding caption.

In analogical form build other four windows (Pictures 25-28). By help this windows we can to enter everything changes in corresponding codes.



Picture 25.

Language

Language Code	Language
	All
10	English
20	Russian
30	Azerbaijani
40	Turkey
50	France
60	Germany
70	Spanish

Picture 26.

Department

IdDep	Department
12558	Economics and Management
15489	Engineering and Applied Science
18477	Medical Sciences
21113	Social Sciences

Picture 27.

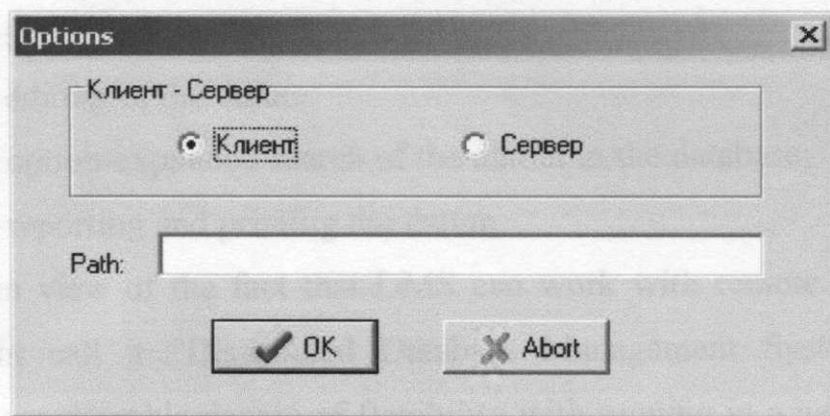
Degree

Degree	Degree code
BS	0
MS	1
Doktor	2
Professor	3

Picture 28.



The sixth window "Options" (Picture 29) applied for choose mode of program work – Client or Server. The filling of fields «Path» indicates the placing database.



Picture 29.

## **5. Conclusion**

Thus, we have built a software system with database supporting. This system, by the definition, is a database management system. It is able to fulfill:

- the storage of the datum;
- the editing of the datum;
- the option-expanded search of the datum in the database;
- the reporting and printing the datum.

And, in view of the fact that DMS can work with remote computers we have the right call it "Distributed Database Management System". Program possessed by considerable degree of flexibility with running in a net environment. It may work as client and as a server. Administrator may reappoint the net folder, where databases located.

This program may properly operate with a set of tables, and its work is not performed separately one table from another one – on the contrary – the tables have been tied one with another by relations between the fields.

The program provides comfortable searching of information inside databases with using mathematical logic operation (operands "OR" and "AND"). During the depicting of the table's contents among the heap of presented information user may distinguish the really necessary datum, because it appear emphasized, highlighted, and more discernible from other information.

The program possessed by an opportunity to differentiate the rights of different category of users (Administrator, Service Employees and simply Readers). The safety of using reached by a way of application of passwords, both in the DMS and inside databases.

With the program's example was vividly demonstrated the advantages of object-oriented method of programming, in respect of adaptation it's in databases technology. But, nevertheless, in the program's internal text was applied the own, unique code of developers, what was shown in the previous chapter.

Also, the essential advantage of the application – it's multilanguage supporting. It can present the book's titles in English, Russian and Azerbaijan language.

This program was tested and gave a reliable results on a Windows-95, - 98, NT, 2000 Professional platforms.

In the final stage of program's elaborating the test version has been shown to the library's personal, what immediately will exploit the system, and it was approved and highly estimated. Due to universality in library's registration sphere, it program may be applied in the university's and institute's, and even in the non-student library.

In a view of foregoing facts, we may conclude that our task by creating of automatized workstation for libraries successfully fulfilled.

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