

**THE STATE COMMITTEE OF COMMUNICATION, INFORMATIZATION
AND TELECOMMUNICATION TECHNOLOGIES
OF THE REPUBLIC OF UZBEKISTAN
TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES**

Allow the defense
Head of the department

_____2014 y.

FINAL QUALIFYING WORK

**On theme: «Ilmiy Ishlar»: Development of subsystems for
systematization and storage of data on conducted research studies.**

Graduate	_____	<u>Umriyayev Sh.A.</u>
	sign	Fullname
Scientific adviser	_____	<u>Pak V.S.</u>
	sign	Fullname
Life safe consultant	_____	<u>Abdullaeva S.M.</u>
	sign	Fullname
Reviewer	_____	_____
	sign	Fullname

Tashkent – 2014

**THE STATE COMMITTEE OF COMMUNICATION,
INFORMATIZATION AND TELECOMMUNICATION TECHNOLOGIES
OF THE REPUBLIC OF UZBEKISTAN
TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES**

Faculty Computer engineering department Information Technology

Direction (specialty): 5521900 – «Informatics and Information Technologies»

APPROVED

Head of the department _____

« ____ » _____ 2014 year.

ASSIGNMENT

of Umriyaev Shokhrukh Alisher o'g'li final qualifying work
(Full name)

1. Theme: “Ilmiy Ishlar”: Development of subsystems for systematization and storage of data on conducted research studies.
2. Theme approved by order of the University of «19» April 2014y. № 254-15
3. Work completion date: 31.05.2014
4. Resources: Statement of the problem, technical data, CCSTD materials, training manuals, internet resources, guides
5. Contents settlement and explanatory notes (list subject to development issues):
Analysis of the subject area, requirements analysis for the subsystem development, design database structure, design subsystem architecture, subsystem realization in a programming language.
6. List of graphic material: Tables, diagrams, user interfaces, presentation.
7. Date of issue assignment: _____

Scientific adviser _____
(signature)

Assignment received _____
(signature)

8. Consultants for the individual sections of the graduation work

Section	Full name of supervisor	Signature, date	
		Task issued	Task received
Main part	Pak V.S.		
Life safety	Abdullaeva S.M.		

9. Progress chart

№	Name of the section	Deadline	Completion mark
1	Introduction	26.01.2014	
2	Analysis of the subject area	30.01.2014	
3	The formation of the task	15.02.2014	
4	Implementing the database	30.02.2014	
5	Implementation of a web portal	30.04.2014	
6	Description of the object model web portal	20.05.2014	
7	Preparation of presentations	25.05.2014	
8	Writing the report	30.06.2014	

Graduate _____ « _____ » _____ 2014 year.
(signature)

Scientific advisor _____ « _____ » _____ 2014 year.
(signature)

This final qualification work is devoted to develop the system “Ilmiy Ishlar” for systematization and storage data on conducted research studies. In this qualification work the necessary entities of the system “Ilmiy Ishlar” and the relations between them are described, methods of storage processing of data are developed, problems are defined and realization requirements are discussed, the formulation of the problem and practice realization of the system are shown. ASP.NET, C# programming language, and also DBMS Microsoft SQL Server 2008 R2 were used in developing the platform.

Данная выпускная квалификационная работа посвящена разработке подсистемы систематизации и хранения данных о проводимых научных исследованиях системы «Илмий Ишлар». В данной работе рассмотрены теоретические сведения о необходимых сущностях системы «Илмий Ишлар» и связях между ними, разработаны методы сохранения данных и для их последующей обработки, определены проблемы и выработаны требования для реализации, приведена постановка задачи и практическая реализация системы. При разработке были использованы платформа ASP.NET, язык программирования C#, а также СУБД Microsoft SQL Server 2008 R2.

Ушбу битирув малакавий иши «Илмий Ишлар» илмий тадкикотлар утказиш буйича маълумотларни саралаш ва саклаш тизимини яратишга багишланган. Битирув малакавий ишида “Илмий Ишлар” тизимининг объектлари ва улар орасидаги боғликликлар куриб чикилди, маълумотларни саклаш ва кайта ишлашнинг самарали усуллари ишлаб чикилди, муаммолар аникланди ва амалга ошириш талаблари ишлаб чикилди, масаланинг куйилиши ва тизимнинг яратилиши келтирилди. Тизимни яратишда ASP.NET, C# дастурлаш тили ва МОБТ Microsoft SQL Server 2008 R2 дан фойдаланилди.

CONTENT

INTRODUCTION	6
CHAPTER 1. THEORETICAL FOUNDATIONS	8
1.1. Analysis of automation object	8
1.2. Methods of systematization and storage of data.....	10
1.3. Statement of the Problem.....	19
Chapter one summary	21
CHAPTER 2. SYSTEM DESIGN.....	22
2.1. Entity relationship model for the system.....	22
2.2. Relational database model for the system	22
2.3. Object model of the system “Ilmiy Ishlar”	22
2.4. Workflow diagrams of the Web application.....	23
2.5. System architecture.....	31
Chapter two summary	33
CHAPTER 3. GUIDANCE ON THE USE OF DATA STORAGE AND RETRIEVE AND INFORMATION SYSTEMATIZATION SUBSYSTEMS	34
3.1. Data storage and retrieve subsystem.....	34
3.2. Information systematization subsystem.....	37
Chapter three summary	46
CHAPTER 4. LIFE SAFETY.....	47
4.1. Hypodynamia and its effect on human health	47
4.2. Safety precautions when working on PC.....	51
CONCLUSION.....	58
BIBLIOGRAPHY	59
APPENDIXES	60
APPENDIX A	61
APPENDIX B	62
APPENDIX C	65
APPENDIX D	71

INTRODUCTION

Currently, modern information technologies increasingly permeate into our lives. They facilitate the collection, analysis, storage and transmission of information, challenges, helping search for the necessary information, and automate routine tasks.

Sphere of scientific research and scientific competitions that attract more and more information and telecommunication technologies and automate all processes starting with news alerts and ending with the final processing of the collected data, are a clear example of the improvement of human activities through the introduction of information technologies.

The actuality of the issue also increases the need to implement tasks arising from the decision of the President of the Republic of Uzbekistan from June 27, 2013 "About measures for the further development and implementation of national information and communication system of the Republic of Uzbekistan ", which targets the development of informatization in the country in the near future.

Starting in 2013, the country has begun work on the formation and funding of the state order for projects to implement interagency integrated information systems of public authorities, the creation of interagency data networks and creating a system of "electronic government" and the national segment of the Internet. [1]

In this final qualification work will be considered a subsystem "Ilmiy Ishlar", which is the part of the complex of the automated information system "Fan", which, in turn, is a part of the e-government systems, and which serves to automate the activities of the Committee for coordination of science and technology development. This subsystem is used to automate the process of the competition of scientific works, including all processes, starting with the notification scientific competition and ending with the adoption of periodic reports on project approvals.

The main purpose of the work is to solve problems of systematization of the information about scientific contests, applications of scientists, which are sent to participate in scientific contests will be considered, methods of storage of data in

database and to define the methods to retrieve the demanded data from database, and to develop the web pages to work with this data and navigation between pages.

The final qualification work consists of introduction, 4 chapters and conclusion.

In the introduction established the actuality of the work, also, the aims and tasks to realize are defined.

The first chapter discusses theoretical basis of systematization of information and the object of automation. It also describes the problem statement and tasks to be solved.

The second chapter describes the algorithm of system design and its stages, as well as ways of its realization.

The third chapter describes the development of the systematization and data storage subsystems.

The fourth chapter is devoted to the basics of life safety. In particular, it describes safety when working at the computer, as well as hypodynamia.

In the conclusion there are main practical and theoretical findings gained from the final qualification work.

CHAPTER 1. THEORETICAL FOUNDATIONS

1.1. Analysis of automation object

Automation object is client's company, area or subdivision, where the system will operate within the domain of automated processes.

Automation object for the "Ilmiy Ishlar" system is the Committee for Coordination Science and Technology Development under Cabinet of Ministers of Uzbekistan (CCSTD).

It was founded in accordance with the decree of the President of the Republic of Uzbekistan PD-436 on August 7, 2006 "On measures to improve coordination and management of science and technology" under Cabinet of Ministers of the Republic of Uzbekistan and it composed of the heads of industries of the Republic and the large enterprises, as well as leading scientists of the country [10].

The decree of President of the Republic of Uzbekistan defined the following main tasks of CCSTD:

- Developing cooperation with the Academy of Sciences, the Ministry of Higher and Secondary Special Education, other ministries and departments priority areas of science and technology, taking into account the objectives of social - economic, social and political development of the country, the achievements of modern science;
- Ensure coordination of the activities of research institutions and agencies, design organizations, institutions of higher education ministries, the Academy of Sciences for the implementation of priority directions of science and technology;
- Organization of effective monitoring of the scientific and technical programs and projects, as well as the results of scientific research in various fields of economy, production, education;
- Development of mutually beneficial international scientific and technical cooperation, attraction of foreign investments in the scientific sphere of the country, to promote scientific organizations, scientists and specialists of the

republic in a wide involvement in international research projects and competitions.

In order to fulfill its tasks CCSTD performs the following functions:

- prepares proposals for the priority areas of science and technology in conjunction with the development strategy of the economy and the social sphere, as well as structural changes in the economy based on the submissions of ministries and departments, research institutions
- coordinates the activities of the ministries and departments in the development of scientific and technical programs, and other innovative research, development projects, monitors their implementation
- provides preparation and implementation of projects for the introduction of promising scientific and technological developments, the results of scientific research in the priority sectors of production, economics, as well as social, educational and other spheres of activity;
- participates together with interested ministries and departments of the republic in the drafting of international agreements of the Republic of Uzbekistan on scientific cooperation with foreign partners;
- coordinates the research activities of scientific and educational institutions of the republic together with foreign scientific centers;
- develops international cooperation in science and technology in order to attract foreign investments and grants, organize the implementation of joint research projects, technological and innovation cooperation with foreign partners;
- organizes national and international scientific and technical conferences, symposia, seminars and meetings;
- participates in the development of legislative acts, legal acts regulating the activities in the field of science and technology, scientific creativity and intellectual property protection, provide for their implementation;

- implements measures popularize and promote science, scientific knowledge and scientific and technological achievements.

To perform its tasks and functions CCSTD has the right to:

- get in the prescribed manner by the Academy of Sciences of the Republic of Uzbekistan, ministries, departments, economic management bodies, enterprises, organizations and institutions necessary information and materials;
- create interdepartmental scientific and technical advice, as well as expert groups on priority areas of science and technology from leading scientists and highly qualified specialists of the Academy of Sciences, ministries and departments, business associations, companies, research institutions, universities;
- participate in the negotiations and to sign on behalf of the Government of the Republic treaties and agreements on international scientific and technological cooperation, promote the establishment of direct contacts between the research and engineering and design organizations of the republic and leading foreign centers on the basis of mutually beneficial relations;
- make within its competence regulations and decisions which are binding on ministries, state committees, departments, public authorities in the field, research organizations and educational institutions;
- publish on matters within the competence of CCSTD, together with other ministries, state committees and departments joint resolutions and other acts

1.2. Methods of systematization and storage of data

An important feature of effective work is quick access to the necessary resources. If the job requires information equipment, it is necessary to provide easy, quick retrieval of information, as well as the systematization of new information.

The primary and most important stage of many business processes in any organization is to systematize information. Thanks to meticulous systematization

of information can achieve good results in the optimization of workflow, as well as savings company and employee time. It is impossible to imagine such critical business processes such as document management, records management, creation of material and electronic archive various databases without prior ordering information.

Systematization of data includes:

- search methods and accumulation of information;
- classification and indexing information;
- ways to access information;
- ways of presenting information;
- processing of requests for information search.

Information can be organized in one of two main ways:

- structured information;
- information in the form of free text.

By structuring understood sequential ordering of the information. It uses standard formats.

Format is an empty form, which contains information. Information may be recorded on paper or in a word processor, or as input data can be placed in the program database.

Standard format is made up of sections of information called fields. The result is a record filled format.

Database is a collection of records organized in such a way as to facilitate the search for a specific record or set of related records, or certain information contained in these records [9]. Another characteristic of a good database is the ability to issue previously recorded data in a different form on the content (of the minimum set of information to be exhaustive) and in the form, which will be presented to the output.

Systematization of information involves the processing of information in order to bring it to a certain type of information and interpretation, allowing the

individual to react in a certain way on the information received. Information processing has it in a certain order, giving it a certain completed forms that fill certain information with meaning and value. Information processing creates images, forms that people can recognize them and understand them in a certain way.

Information systematization by the person is carried out by two ways. The first way is logical information processing. For this way information transformation is characteristic systematic and consecutive on the basis of logical operations. It is a so-called scientific way of information processing. But the person doesn't only logically processes information, bringing it to the state, allowing carrying out actions in response to the received influences from the environment. The person also processes information, using feelings, preferences, emotions, belief. In this case information is processed by the principles "I love - I don't love", "it is pleasant - it isn't pleasant", "it is good – it is bad", "it is better – it is worse", "is acceptable - is unacceptable", etc.

Perception is very difficult, many-sided and swift-flowing process. It is incorrect to think that phases of selection, processing and an assessment are rigidly differentiated and follow one another in accurately certain form and according to the unambiguous scheme. Search of decisions can be based on information of various types. For convenience of using it is important to provide various options of submission of information, or, data representation forms.

We will consider some typical types of systematization of information.

Nominal systematization represents distribution of information on document type – contracts, accounts, acts, orders, etc.

Subject systematization – distribution of information on contents of documents: for example, in one folder the documents connected with building of object No. 1, and go to another – with building of object No. 2.

Chronological systematization of information groups' documents according to certain time frames – for example, all accounting documentation is stored in "this" folder for 2008. Quite demanded type of systematization is classification of

documents by the author or group of authors. To application in archives the expert systematization of information distributing documents on terms of their storage is obligatory. After carrying out process of systematization of information, the nomenclature of affairs – the list of names of documents, a peculiar reference book is formed. Then all documents are indexed.

Systematization of information applies to both the material (paper) documents and electronic. Drafting classification of paper documents, the subsequent creation of the nomenclature Affairs and indexing is a laborious process requiring special skills, the implementation of which stands to provide professionals. In computer programs - "Electronic Archives" - the process of organizing information is done automatically for the given parameters, but also requires the utmost care and accuracy.

Systematization of documents is carried out in order to allow users to more easily find relevant documents. In the Documentation Centre at this stage performed two basic operations - cataloging and physical custody of documents. Cataloging, in turn, consists of several steps:

- bibliographic description
- a description of the contents of document
- purpose of the document location indicator

Cataloging

Catalog is an ordered set of links on the individual storage units in the collection [9]. In other words, the catalog is a list. But at the same time, more than just a list, each item on the list is a single record containing various pieces of information such as title, author name and description of the contents. The catalog can be represented as a list or a set of small secondary documents (e.g., index cards) in a particular order. Card catalog - is a list in which each individual record or reference written on a separate card.

Well-organized documentation center must keep records describing all materials in its collection. Cataloging means creating a short note on the document

and then included in the list of records used in the search. Short records contain the necessary information that helps users to search for key documents.

Previously, the most common method of cataloging was to create catalog cards. Information about each document is copied on several cards, one card - for each base search. Search base - is the title at the top of each card, which can be the name of the author, title, or any term of used to describe a document theme. All cards with a single search base, for example, all contain the author's name are grouped together and then arranged in alphabetical order. Thus, the user can search for a card by author, title or subject.

Another common method is the representation of a directory in the form of a printed volume with sections in which records are listed by title, by author and by topic. This method has serious limitations, because the addition of each new material to the library entails fingerprint new directory.

More efficient method of cataloging practiced nowadays is to use standard bibliographic format using a computer when each storage unit (eg, books, chapters in a book or article) creates only one record, and relevant computer programs provide the ability to search.

Each directory entry, whether in the form of card catalog, whether the item in the list or write in standard bibliographic format, must include several types of information. This bibliographic description, information about the content and the pointer to the appropriate location of the document. Each of these types of information are discussed in the following sections.

Set of rules, such as Anglo-American Cataloguing Rules, gives basic instructions on how to enter information in the catalog, including rules on the location and use of punctuation, especially in the case of the card catalog. Anglo-American Cataloguing Rules were adapted and simplified into HURIDOCS, and published under the title HURIDOCS Standard Formats for the Recording and Exchange of Bibliographic Information concerning Human Rights.

Bibliographic description

At this stage, there is a record of information that describes the document as a physical media. This step can also be called reception document identifiers. The main identifiers are title, author, publication, edition, publisher and year of publication.

Storage of documents

Document, in whatever form it may be - on paper, in the form of a tape recording, or information on a computer disk - must be stored in accordance with a particular system in order to, if necessary, it can be found in the collection at minimal cost. Complete storage system includes the following components:

- device to help the retrieval of documents
- physical media documents
- the order in which documents systematize

Device to help the retrieval of documents, are the kind in which the cataloging. Searcher may be card directory list directory entries or a computer database.

As physical media documents most commonly used to store folder. Folders can be used to store individual documents or sets of related documents, stapled or stitched together. Folders can be placed in filing cabinets or in special vertical boxes, putting on the shelves. Books also often stored on the shelves.

Physical media documents perform another function: the documents within them are arranged according to a specific order. Documents can be arranged simply in alphabetical order by author or source (document or a private document organization) can be arranged in chronological order by date of creation or receipt in the collection or in accordance with the type, size and format of the document , the system alignment can also be based on geographic data. Besides, documents can be grouped by topic.

Assigning the location indicator of the document

In order to store documents in the correct order and to facilitate their search, often required to install symbols that indicate the location of the documents.

Numbering records term is also often used to describe this process, since the number is usually, but not always, are used as symbols.

Similarly, a pointer to indicate the location of the document used a variety of terms, among them:

- document symbol
- record number
- record identifier
- signature catalog
- classification code
- reference number

Usually, documents are stored together, for example in one folder on the same shelf or in a box, assigned consecutive numbers or symbols, for example:

- numerical: 1,2,3,...
- letter: from A to Z
- alphanumeric: A1, A2, A3, ... B1, ...
- numerically-letter: 1A, 1B, 1C, ..., 2A, ...

The index can include year or month of creation or receipt in a collection, the source name, geographical terms or the document code, for example:

- 1999-001, 1999-002, ... , 2000-001, ...
- AI-001, AI-002, ..., HRW-001, ...
- AFR-001, AFR-002, ..., ASIA-001, ...

At the same time, the document may be assigned to the pointer depending on the class to which the document belongs.

There is a certain sequence of actions that must be followed when specifying the location of the document. The first documentary to decide which will be assigned to a pointer document. For example, if the documents are arranged in sequential order, a documentary should find out which pointer was last used, or if you use a classification scheme, select the appropriate class. The next step - mark the document given to him by the pointer. If it is a book, a pointer is typically

applied to the spine. On folders usually have labels (stickers), which may be made notes on sheets of paper and pointers can be in the form of print. After the application documents shall be pointers to the place of their future storage.

At the end of the process of cataloging assigned pointers made in the card catalog, list or database used to search for documents.

Furthermore, indicators are usually applied to a document repository (folders, cabinets with drawers, shelves or boxes). These pointers are usually composed of the first indicator symbols documents held inside.

Classification

Classification - a method of assigning documents pointers based on clearly the dominant theme of the document [9]. This method has the following advantages:

- all key documents on a particular topic in one place, where they can be easily found;
- avoids the intermediate process of finding the necessary documents in the catalog or database;
- unprocessed documents can be sorted and placed on a temporary or permanent storage, where they can then be easily found on the domain;
- without the help of documentary users can locate the correct document, examining topics related to this, and even come across a few more relevant documents, which they never even thought.

There are three classification schemes that are widely used throughout the world: the Library of Congress classification scheme, Universal Decimal Classification and the Dewey Decimal Classification. This general scheme covers the entire area of knowledge. They are too general and therefore cannot be applied in a specialized documentation center, but they can yield some of the concepts and use them in their work. Often human rights documentation centers have developed their own classification scheme. Standard Classification Scheme for Human Rights Documentation Center was developed Iva Caccia, serving the Canadian Human Rights Documentation Centre, and is available HURIDOCS.

Unique record identifiers

Often, when working with certain types of documents, you need to be sure that the documents are unique location indicators, ie they are used only once and only for one document. This is particularly important when the document information storage repositories meeting uses computer database. In computer terminology, a pointer to the location of a document called a unique identifier for the record. Most software for databases has a feature that manages the automatic assignment of unique numbers record.

Bibliographic records in a computer database frequently assigned unique IDs and record simultaneously contain other location indicators that point to key documents. Mainly this takes place in cases where the classification scheme is used for organizing original documents.

Types of information search

Finding information may refer to:

- Data Search - search for specific information, consistent with the objectives of the user. For example, the user may need to know the name of the victims of the recent violations. At a more sophisticated level of data retrieval is required to perform calculations and estimates.
- Search documents - in this case sought documents containing information.
- Search supporting documents - in this case not sought as such documents and records, which contain sufficient information to enable the user to determine whether that is the document that he is looking for. Supporting documents may be a registration card, a bibliography, summary or record in a computer database.

In conventional libraries tend to apply the third search method, and are commonly used for this filing catalogs. If the system also allows open access, then finding the right documents easily feasible. On the other hand, a separate list of information, data is only possible with a computer in which data should be entered before they can be found.

In full-text databases, search of documents is performed by computers.

1.3. Statement of the Problem

Required to develop a subsystem organizing and storing information in the "Ilmy Ishlar" in accordance with the requirements specified in this system.

The "Ilmy Ishlar" system is intended for collecting, processing, systematization and storage of information on results of the conducted and conducted scientific researches.

This information system is formed and supported on the basis of the CCSTD information resources.

Requisites of Ilmy Ishlar system include the following data:

1. Type of research
 - Fundamental
 - Applied
 - Innovative
2. Program
 - If fundamental – from the “Fundamental program” reference
 - If applied – from the “Applied program” reference
 - If innovative – from the “Innovative program” reference
3. Type of project
 - Ordinary
 - Interdepartmental
 - International
4. Ministry name
 - From the reference
5. Code of research
6. Code of project
7. Title
8. Keywords
 - Up to 50 words

9. Manager of project
 - From the reference
10. Number of performers
11. Co-executors
 - From the “Organizations” reference
12. Period (beginning of works)
13. Period (finishing of works)
14. Gained results (annotation)
 - In the form of the document in the PDF format.
15. Gained results (full content)
 - In the form of the document in the PDF format
16. The amount of funds for the year (in sums)
17. Participation in fairs
18. Implementation of the results of work
19. Number of monographs, textbooks, manuals on the theme
20. Number of articles on the theme
21. Number of patents

Information system projects CCSTD must meet the following functional requirements:

- store and provide access to information on the priority directions of scientific and technological development
- store and provide access to information about the priority of the state scientific and technical programs
- store and provide access to information about the types of studies and projects
- store and provide access to the basic data about the projects by the following classification categories:
 - project categories
 - sources of financing of projects

- duration of projects
- managers and performers of projects
- organizations, where the projects are executed (as well as scientific and educational organizations)
- generate reports according to established forms
- provide convenient input, retrieval and processing of information

In this final qualification work it is required to realize subsystems of systematization and the storages of information meeting the established requirements to “Ilmy Ishlar” system and providing convenient methods of storage, processing, search and retrieve information from the database by the required criteria.

During developing these subsystems it is necessary to solve the following problems:

- to design architecture of system
- to design database structure, meeting the established requirements
- build a class diagram that meets the criteria of systematization, the requirements for the system "Ilmy Ishlar"

Chapter one summary

In chapter 1 the analysis of object of automation – CCSTD was carried out, the bases for creation of this Committee were analyzed; its functions and power are considered.

Considered the theoretical basics of organizing and storing information and analyzed the existing types and methods of information storage.

Given a problem statement and defined modules of the system, requiring the design and development process.

CHAPTER 2. SYSTEM DESIGN

2.1. Entity relationship model for the system

The process of designing and creating a database consists of three stages:

- domain analysis, which was presented in the first chapter
- construction of entity-relationship model (ER-model), based on the domain analysis
- designing relational data model, based on the entity-relationship model

Each of the stages will design a database in detail, without losing the data you need.

Entity–relationship model (ER model) is a data model for describing the data or information aspects of a business domain or its process requirements, in an abstract way that lends itself to ultimately being implemented in a database such as a relational database. The main components of ER models are entities (things) and the relationships that can exist among them [13].

ER-model is useful in the design of information systems, databases, architectures, computer applications and other systems (models). With the help of this model allocates substantial elements (nodes, blocks) model and establish relationships between them.

Figure A-1 from Appendix A shows the entity relationship model for "Ilmiy Ishlar".

2.2. Relational database model for the system

The relational database model of a domain is a set of relations that change over time. When you create a set of relations information system allows you to store data on objects in the domain and model the relationships between them [3].

Figures B-1, B-2, B-3 from the Appendix B show the relational model of the database of "Ilmiy Ishlar".

2.3. Object model of the system "Ilmiy Ishlar"

The object model of the Web portal "Ilmiy Ishlar" is a collection of classes that are shared by the business logic classes and object-relational view. It is the link between the client application and the database (See figure 2.1).

Following the separation of the group classes is divided by their functionality and application. All of these groups are interdependent.

Classes of business logic are called as well as table names stored in the database and they reflect the main types of data that will assist manipulated using classes that have the prefix “Provider”.

Classes of object-relational view, starting with the prefix Provider are strictly structured classes where public methods can be only four types of methods (CRUD) - are methods for retrieving, adding, deleting, updating the database data. The remaining helper methods that are private should not directly interact with the database, and can only include the logic that has been repeatedly used in the basic methods of the class object-relational view.

Architecture of classes of object-relational presentation and business logic is the same for all groups of classes.

The classes of business logic (Figures C-1, C-2, C-3) and classes of object-relational representation are given in the Appendix C (Figures C-4, C-5, C-6).



Figure 2.1. Interaction Scheme in the system

2.4. Workflow diagrams of the Web application

The research phase have been identified all possible use cases. These use cases are shown in the use case diagrams.

Use case diagram is a chart that reflects the relationship between actors and precedents.

The main objective of use case diagrams is to represent a single tool, enabling the customer, end users and developers together to discuss the functionality and behavior of the system.

Registration

Client-side come the personal data required for registration. Web application checks them for accuracy, checks on the uniqueness of the values of the username and email address. If successful, conducts the registration and shall notify the client of its success by offering to continue the further identification in the system (Figure 2.2).

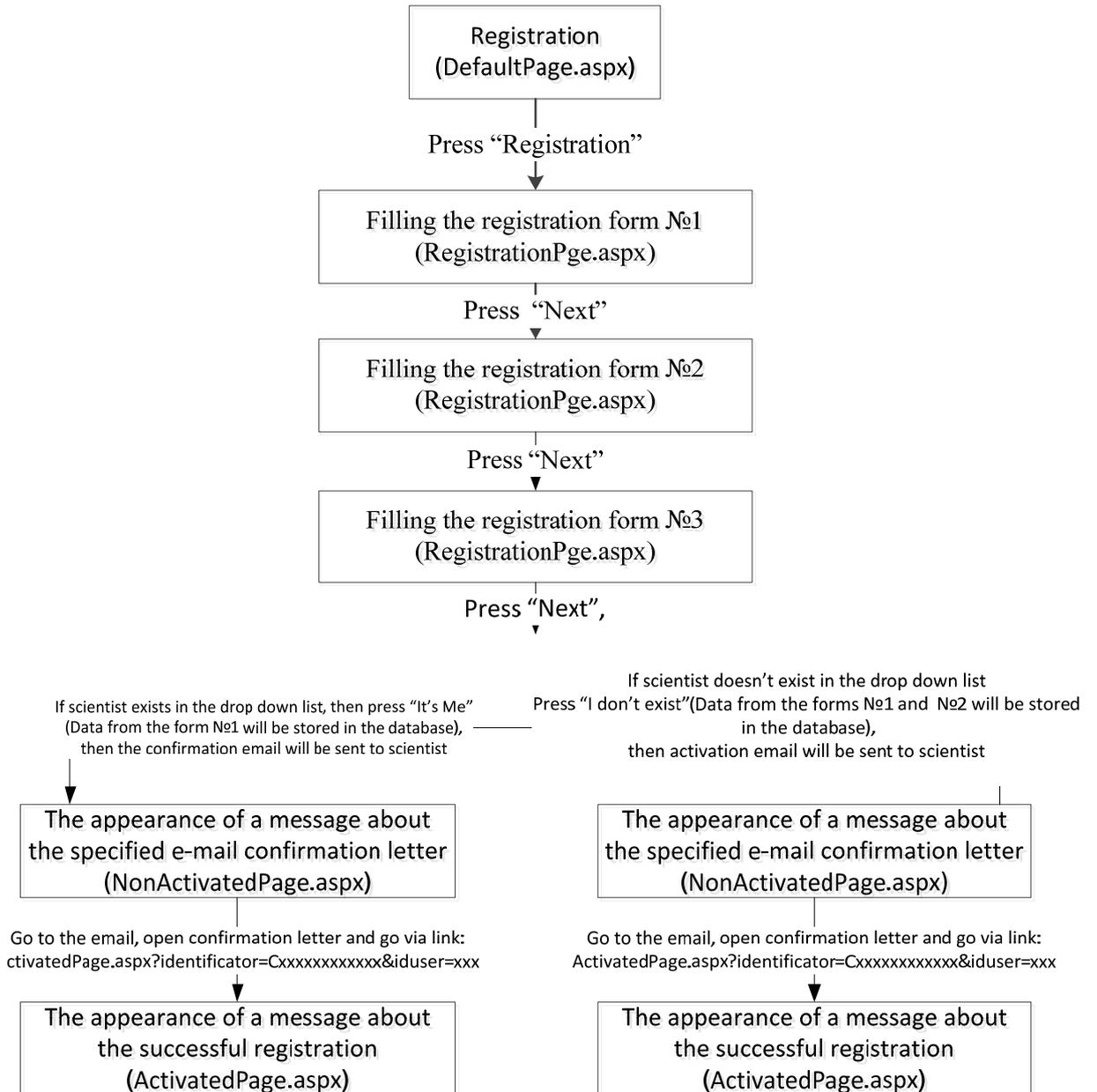


Figure 2.2. “Scientist’s registration” workflow

Creating contest

Committee announces about the new competitions of scientific works. On the basis of contests happens acceptance of applications for participation in the contest. Operator fills out a form for adding contests. System checks the data to be correct, then it is added to the database and it will appear on the competitions page (Figure 2.3).

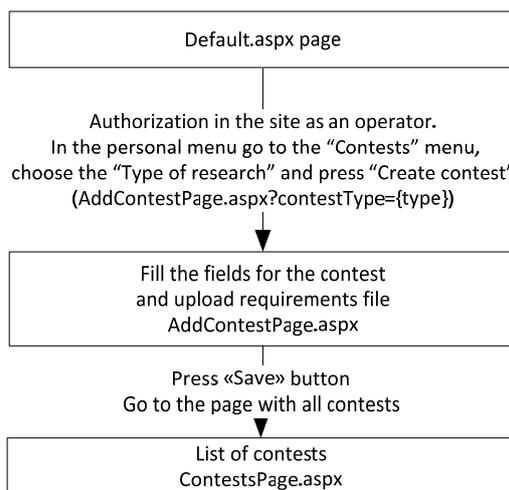


Figure 2.3. "Creating contests" workflow

Creating application

After the operator created the contest, the scientist has an opportunity to add an application to participate in contest. Creation of the application happens in four stages, in each of stages the system checks correctness of entered data. At a stage of addition of participants of the project, the system checks rates of each participant. In the last step all information about the created application will be displayed, where the scientist can edit it. There are two forms of creating applications: for innovative competitions and for fundamental and applied contests and competitions for young scientists. Depending on the type of chosen competition system will redirect to the appropriate form of creating application (Figures 2.4 and 2.5).

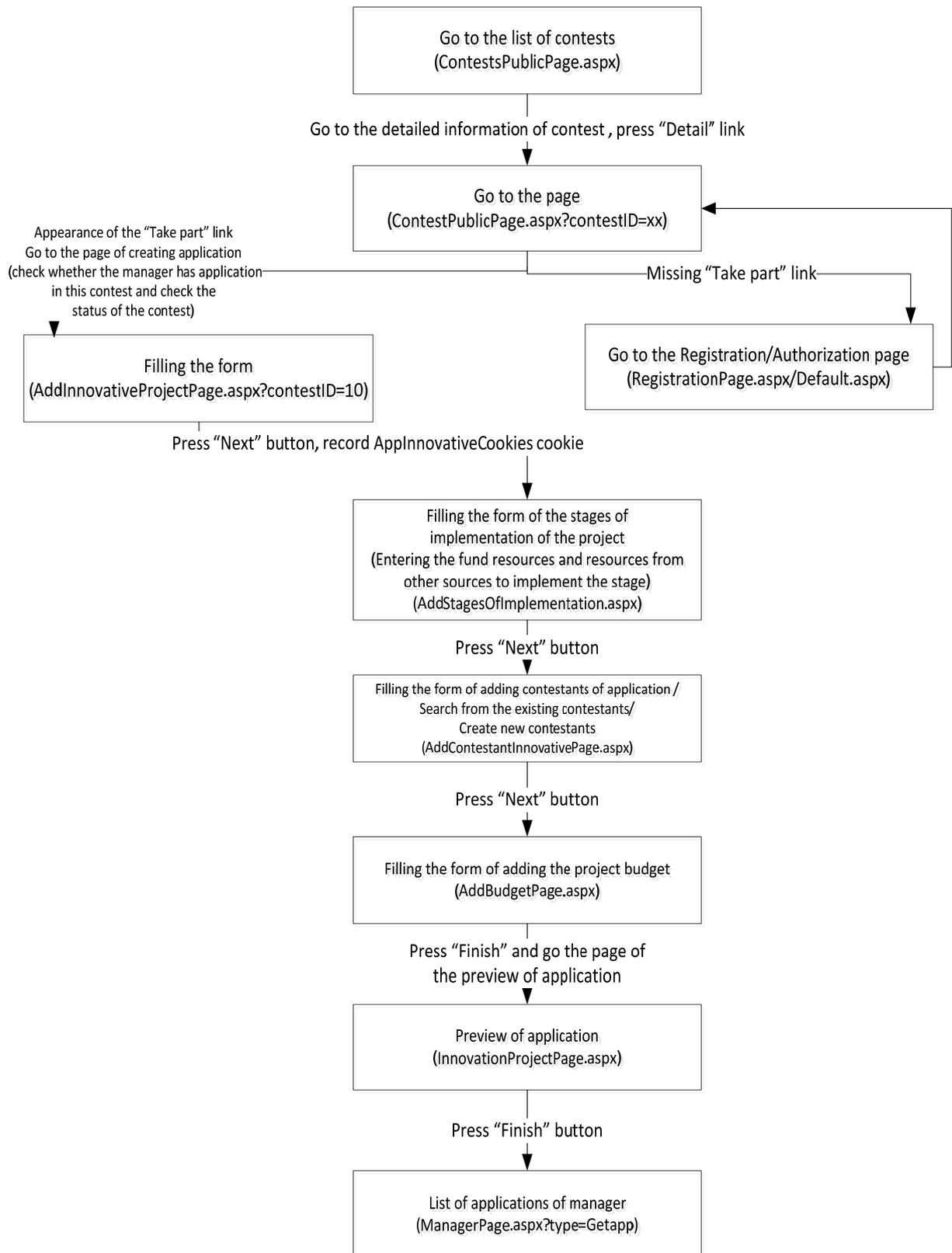


Figure 2.4. «Creating application for the innovative contest» workflow

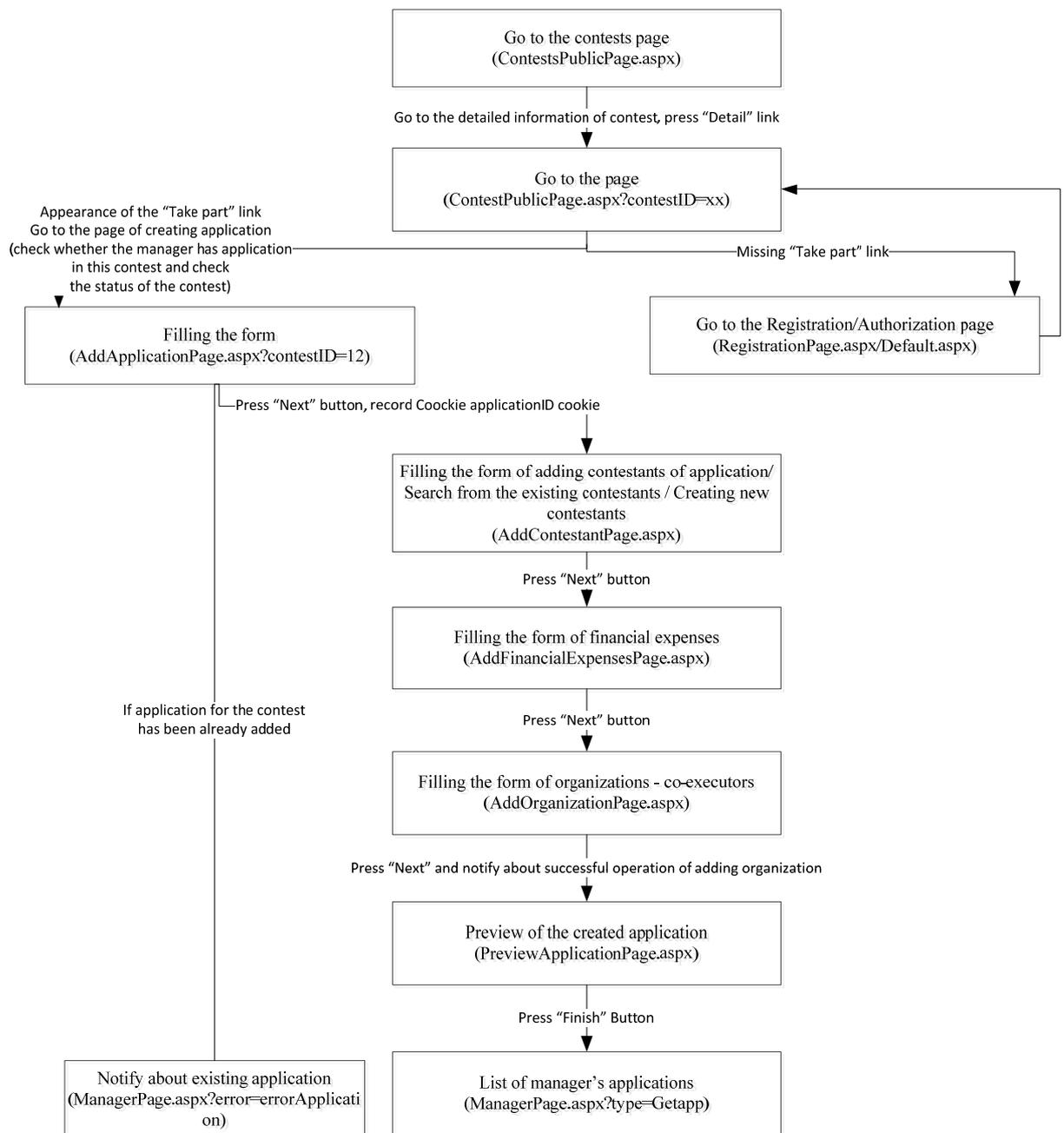


Figure 2.5. “Creating application for fundamental, applied and young scientists contests” workflow

Creating project reports

At the end of each year, the project manager must send a report on the project. Ability to add the report is only available in the reporting period. Manager, who sent the report, has no right to add the report again. If the report is rejected by the operator, the manager will be notified about this and he can send it again. At the end of last year, the project manager has the right to submit a final report after he had already sent the annual report. Input data are checked on the report system (Figure 2.6).

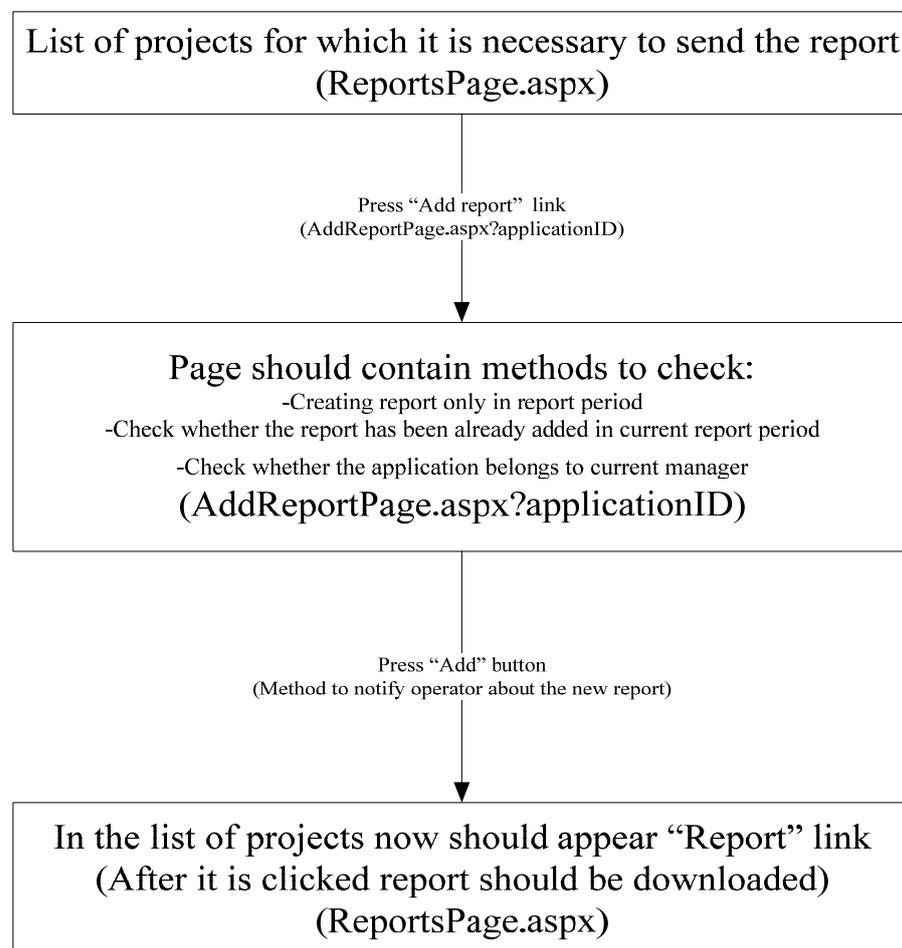


Figure 2.6. "Creating project reports" workflow

Forming the program

On the basis of the reports sent by project managers, Committee on the Council decides which projects will be financed in the following year. The system generates program for the year on the basis of entered decision of the Council to the system generates a year. Then the program can be saved in formats xls, doc and pdf (Figure 2.7).

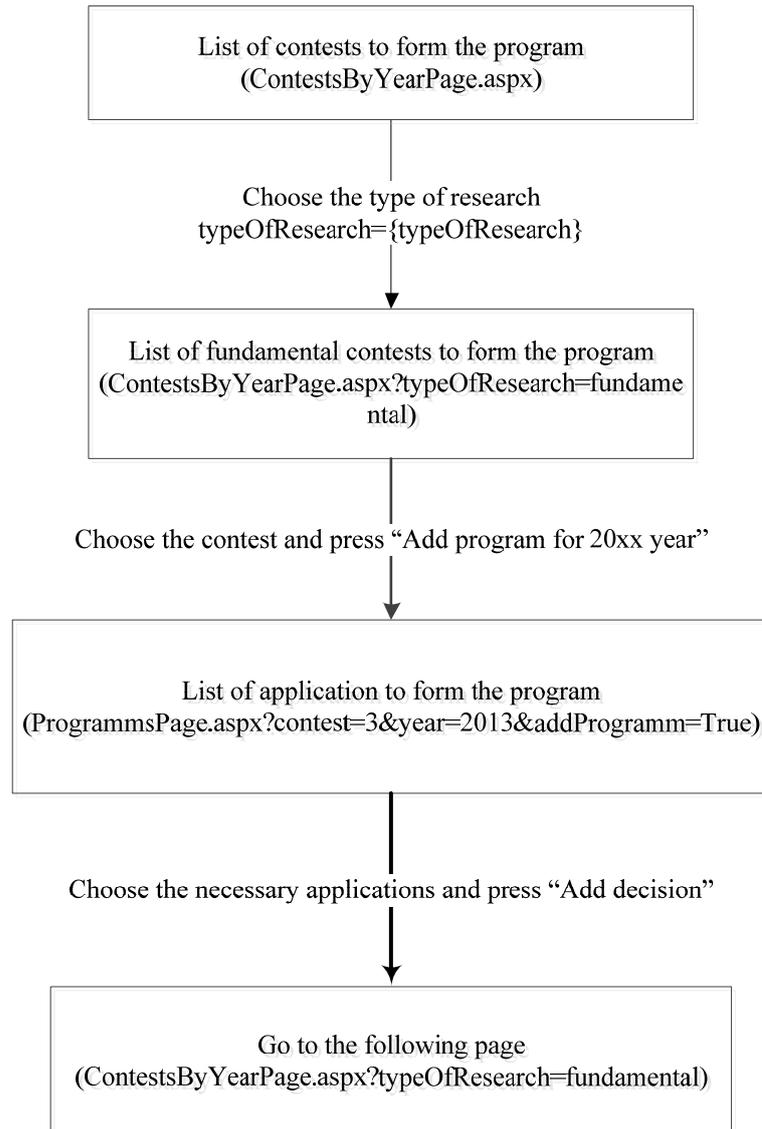


Figure 2.7. "Forming the program" workflow

Creating reports

On the basis of the input data during the registration of scientist, the system provides generation of the following types of report:

- Report by ministries
- Report by scientists
- Report by organizations
- Final report for republic
- Final report by organizations
- Final report by ministries and scientific specialties
- Final report by organizations and scientific specialties
- Final report by scientific specialties

In the first three reports a list of scientists by ministries, organizations and all the scientists that are stored in the system database is shown. Final reports provide numerical values for scientists, i.e. scientists are counted according to predefined parameters. All reports can be eventually exported into formats xls, doc and pdf (Figure 2.8).

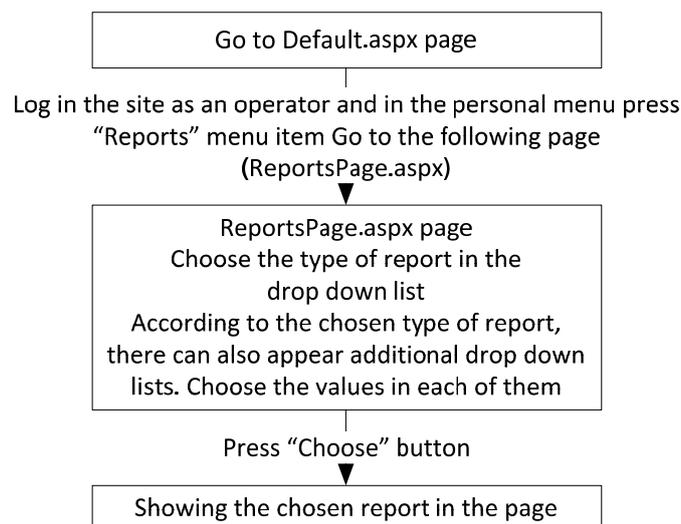


Figure 2.8. "Creating reports" workflow

2.5. System architecture

The architecture of the system "Ilmiy Ishlar" is logically divided into 3 large subsystems: subsystem of scientific works, references and administration subsystem.

Scientific works subsystem includes the following modules:

- Information about projects
- Information about contests
- Reporting system
- Information about scientific research
- Information about scientific events
- Search by criteria

References subsystem is used to display the explanatory information and systematizing the information stored in the subsystem of scientific works. For example, the "Type of research" organizes contests and projects, and "Contest status" is used to control ability to send the applications to contests.

This subsystem consists of the following modules:

- Experts
- Branches of science
- Decisions of experts
- Contest statuses
- Priority directions
- Posts
- Types of research
- Types of report
- Types of publication
- Types of project
- Types of contest
- Expert grades

The subsystem of administration serves for distribution of users on roles and depending on their role to provide the rights for certain actions and pages. For example, for the users who are in a role "Operator" it is authorized to create contests, to check the reports sent by managers, to respond to messages of managers, etc. And it is authorized to the users who are in a role "Manager" to send applications to scientific contests, to send reports to the approved projects, to address to operators with questions in the form of messages, etc.

This subsystem includes the following modules:

- Users
- Roles

Further, in Figure 2.9 architecture of the system is given.

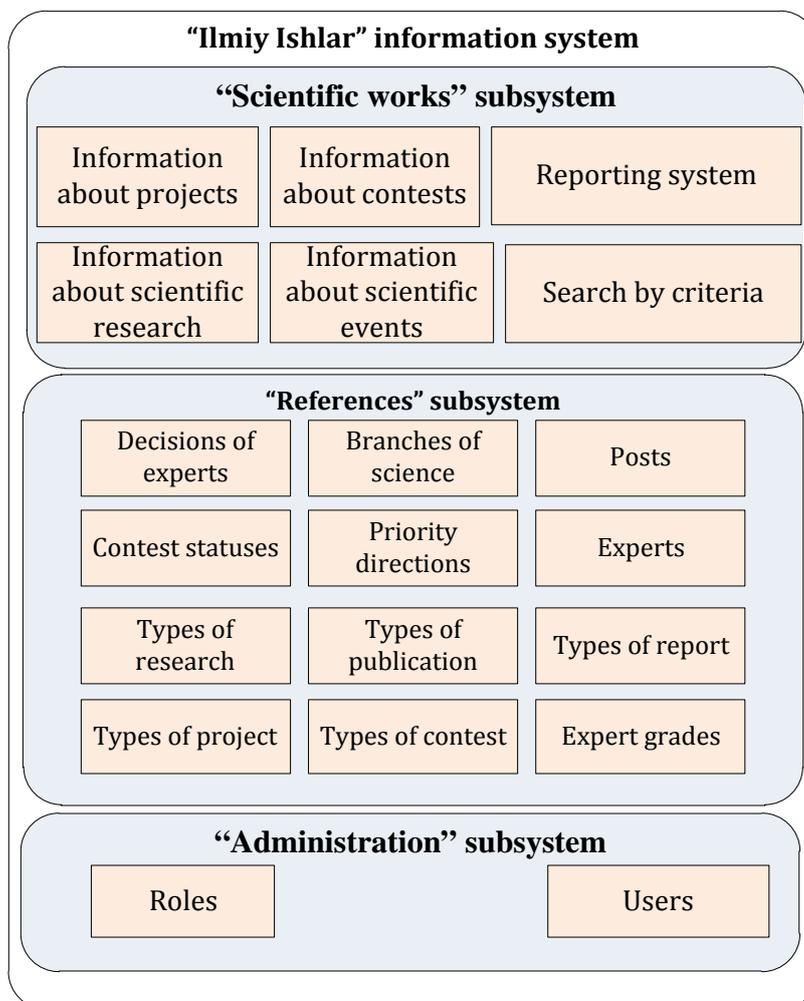


Figure 2.9. System architecture

Chapter two summary

Based on the domain analysis entity relationship model and relational database model were built, which allowed to perform the following operations:

1. MS SQL Server 2008 R2 was selected to build this database.
2. An object model of web-portal and class to retrieve information from the database and show in the web-pages were designed.
3. Functional diagram of the web-portal was designed
4. System architecture was designed. It consists of following subsystems:
 - “Scientific works” subsystem, which consists of 6 modules
 - “References” subsystem, which consists of 12 modules
 - “Administration” subsystem, which consists of 2 modules

CHAPTER 3. GUIDANCE ON THE USE OF DATA STORAGE AND RETRIEVE AND INFORMATION SYSTEMATIZATION SUBSYSTEMS

3.1. Data storage and retrieve subsystem

To implement the system "Ilmy Ishlar" it was decided to use an object-oriented architecture and to store data in a relational database.

For effective work with data from a database in the "Ilmiy Ishlar" needed a mechanism for mapping relational data into objects. Technology that implements such a mechanism called the ORM-Object Relational Mapping.

Object-relational mapping (ORM, O/RM, and O/R mapping) in computer software is a programming technique for converting data between incompatible type systems in object-oriented programming languages. This creates, in effect, a "virtual object database" that can be used from within the programming language. There are both free and commercial packages available that perform object-relational mapping, although some programmers opt to create their own ORM tools [12].

Required that our implementation of ORM technology concealed SQL and provided readable familiar C # code. Also needed to be able to perform all four basic queries SQL, namely: SELECT, INSERT, UPDATE, and DELETE.

Also the high speed of construction and performance of queries was required.

To meet the requirements set DataProvider class was written, which provides a friendly interface to the database and hides the entire process of building a SQL query and its execution.

In that class the following four methods were implemented:

1) Method to build an SQL query – SqlRequestBuilder

It has the following input parameters:

sqlRequestType – type of SQL query, which is the type of the following enumeration:

```
protected enum SqlRequestType
{
    Create,
    Read,
    Update,
```

```
        Delete
    };
```

where Create stands for creation of the new data in database

Read stands for retrieving data from the database

Update stands for updating the existing data in the database

Delete stands for deleting the existing data from the database

fields – list of string data, that identifies the fields of the table by which we want to build the query

values – list of object data, that contain the values to select

nameOrderingBy – to define the field by which retrieved records should be sorted.

Method returns the resulting SQL query as a string value.

Method checks whether the values list is empty or not and if it is not empty the forming SQL query will be created with the additional parameters to send to the database. These parameters will be added later in the `SqlRequestHandlerMethod`.

2) Method to execute SQL query – `SqlRequestHandler`. It takes the same parameters as `SqlRequestBuilder`, and serves to add parameters to the building SQL queries and execution of the prepared SQL query.

If the SQL query should return the values from the database, then the method saves the resulting data in the `DataReader` object, which will be available for the caller methods of `Provider` classes.

3) Methods for opening and closing the connection to the database.

Connection is opened in the method `SqlRequestHandler`, and is closed in the calling method, as in the opposite case, the methods will not have time to get the data on request. In these methods firstly the connection state to the database is checked, and in the `OpenConnection` method it will be opened if it was closed and in `CloseConnection` method vice versa.

This class is the parent class for all so-called provider classes. All provider classes implement the methods for creating, modifying, and deleting records, reading a record by its ID, and retrieving of all records in the table.

Provider class is the link between the system objects and database tables.

For every table in the database in the system exists the object class and for every object class there is a provider class in the system.

All the provider classes named with the structure <Object_name>Provider and the method for creating data in the database is called Create<Object_name> and so on.

Create<Object_name> method prepares the data, which will be inserted via the DataProvider class. It sends to the DataProvider class's SqlRequestHandler method the list of columns and the list of values of these columns which are should be inserted.

Update<Object_name> method also prepares the data, which will be updated via the DataProvider class. The difference between the Create<Object_name> method and the current method is Update<Object_name> method additionally sends the ID of the object, which is being updated. The another difference is the Create<Object_name> method sends SqlRequestType.Create, which will inform SqlRequestHandler method about the creation process, and the Update<Object_name> method sends SqlRequestType.Update, which in turn informs about updating process.

Delete<Object_name> method sends only ID of the deleting data and SqlRequestType.Delete to inform SqlRequestHandler about the deleting process of the object from the database.

GetAll<Object_names> method only sends SqlRequestType.Read to the SqlRequestHandler to get all the data from the table. After the data is being received the method maps them to the objects of the system.

Get<Object_name>byID method additionally to the SqlRequestType.Read sends the ID of the demanded data and maps the received data to the object of the system.

All provider classes are built on this principle. As can be seen from the examples in the provider classes don't have any methods, which are building a

SQL query. All operations associated with SQL queries delivered in class DataProvider, and other provider classes use these methods of class DataProvider.

3.2. Information systematization subsystem

Information systematization subsystem is based on such processes as Creating contest, Creating application, Creating application for the innovative contest and Manager Registration.

Thus, the subsystem provides:

- Storage and providing access to information about ongoing research projects competitions
- Storage and access to information about the applications sent to participate in contests
- Storage and access to information about managers.
- Easy entry, searching and processing information.

Creating contests is carried out by operators. Created contests become available to scientists, registered in the system, and they can send applications to participate in these competitions.

When contest is being created operator must select the type of research, in which competition is being announced, enter the name of the contest, and enter the date of funding, start and end date of entries.

After the type of research has been chosen, priority directions for this type of research become available to select. Operators can select the number of priority directions that meet the requirements of the contest which is being advertised. After entering all the necessary data, the operator must upload the pdf file with the requirements of the contest.

Further, in Figure 3.1 the process of creating contest is shown.

After the contest has been created and its status has been established to “Acceptance of applications” the “Participate” link becomes available for scientists to send applications to participate in the created contest. Creating application differs by type of research, and has to types: General type of creating applications to participate in the contests with the fundamental, applied and young scientists

types of research and a separate application form for creating application to participate in the contests with the innovative type of research.

The screenshot shows a web application interface for creating a contest. The top navigation bar includes 'Home', 'Contests', 'Contacts', and 'About committee'. On the left, a 'Personal menu' contains links for 'Contests', 'Projects', 'Reports', 'Messages', 'Report notifications', and 'References'. The main content area is titled 'Creating contest' and contains several form fields: 'Contest name (in russian)', 'Contest name (in uzbek)', 'List of priority directions' (a scrollable list with checkboxes for various scientific fields), 'Begining of financing', 'Begining of receiving applications', 'Ending of receiving applications', 'Contest status' (a dropdown menu), and two 'Application requirements' sections (one in russian and one in uzbek) with file upload buttons. A 'Save' button is at the bottom. An 'Announcement' box on the right contains a message about account activation and login options.

Figure 3.1. Creating contest

This decision was taken due to the fact that the first three types of research fields are the same, but in the case of an innovative type of research required fields are different.

In both cases, the creation of an application takes several stages. They are divided into segments by the value of required fields to fill. In both cases, the first stage is introduced general information about the application. Further steps are different depending on the type of application to be added.

In the second stage of creating of the application for fundamental, applied types of research and the research type for young scientists is required to enter information on participants of the project.

Every participant can participate in maximum of two projects on a full-time or four projects on an underemployment.

At the third stage of creating application required to enter information about financial expenses for the project. Manager should enter the amount providing by the Committee and it will be distributed by the types of expenditure.

In the fourth step the project manager should add information about the organizations – co-executors, if any.

Manager is scientist, who is creating the application.

The project has the performer organization from which this application is sent, and can be more organizations – co-executors, who will also participate in the project.

At this stage, the creation of an application ends and takes manager to a preview page of the created application. If all data are correct, then the application is stored in the database, if the manager forgot to add some required information, he may be redirected from this page to page of adding the required information.

In the following figures 3.2-3.6 pages of creating application are given.

The screenshot shows a web interface for creating an application. The top navigation bar includes 'Home', 'Contests', 'Contacts', and 'About committee'. A left sidebar contains a 'Personal menu' with options like 'My applications', 'My projects', 'My data', 'My publications', 'Work places', 'Project reports', 'Messages', and 'Report notifications'. The main content area is titled 'Applying application' and contains the following fields and elements:

- Scientist Name (in russian):** [Шохрух Умрияев Алишерович](#)
- Name (in uzbek):** [Empty text field]
- Contest:** [Dropdown menu: Конкуро фундаментальных проектов 20]
- Priority direction:** [Dropdown menu: Духовно-нравственное и культурное р]
- Branch of science:** [Dropdown menu: Физико-математические науки]
- Upload project file:** [File selection button: Выберите файл | файл не выбран]
- Annotation (in russian):** [Large text area]
- Annotation (in uzbek):** [Large text area]
- Next:** [Button]

On the right side, there is an 'Announcement' box with text: 'Dear users! All who registered and did not receive the activation link, click on the link below! And those who are active, please change your password by logging into your account! [Reactivation](#) Welcome to personal cabinet shoxmanager Logout Change password'. Below it is a 'Directions Site:' box.

Figure 3.2. Creating application (the first step).

Home Contests Contacts About committee

Create form

Project contestants

CID	Fullname	Rate	Edit
963	Абулкосимов Хасан	0,5	Delete Select

Search

Contestant Search

Search results

Post

Add post

Rate 0,5 1

Save Next

Announcement

Dear users! All who registered and did not receive the activation link, click on the link below! And those who are active, please change your password by logging into your account! [Reactivation](#)

Welcome to personal cabinet shoxmanager

[Logout](#)
[Change password](#)

Directions Site:

Figure 3.3. Creating application (the second step).

Home Contests Contacts About committee

Personal menu

- My applications
- My projects
- My data
- My publications (+)
- Work places (+)
- Project reports
- Messages
- Report notifications
- Not complete application(1)

Enter fund resources

Fund resources

Proportion

Expense items

Type of expense	Performer organization	Group
	Organization	Organization co-executor
Payroll	<input type="text" value="618096.4"/>	<input type="text" value="0"/>
Overhead expenses	<input type="text" value="309548.2"/>	<input type="text" value="0"/>
Travel expenses	<input type="text" value="77387.05"/>	<input type="text" value="0"/>
Materials	<input type="text" value="77387.05"/>	<input type="text" value="0"/>
Equipment	<input type="text" value="309548.2"/>	<input type="text" value="0"/>
Other expenses	<input type="text" value="154774.1"/>	<input type="text" value="0"/>

Save

Announcement

Dear users! All who registered and did not receive the activation link, click on the link below! And those who are active, please change your password by logging into your account! [Reactivation](#)

Welcome to personal cabinet shoxmanager

[Logout](#)
[Change password](#)

Directions Site:

Figure 3.4. Creation application (the third step).

Home Contests Contacts About committee

Personal menu

- My applications
- My projects
- My data
- My publications (+)
- Work places (+)
- Project reports
- Messages
- Report notifications
- Not complete application(1)

Create form Show the form of adding organization

Organization

Save Next

Organization co-executors

Announcement

Dear users! All who registered and did not receive the activation link, click on the link below! And those who are active, please change your password by logging into your account! [Reactivation](#)

Welcome to personal cabinet shoxmanager

[Logout](#)
[Change password](#)

Directions Site:

Figure 3.5. Creation application (the fourth step).

Figure 3.6. Creating application (Preview of the created application).

Creating application for the contests of innovative type of research is divided into four stages.

In the first stage general information about the project is required to add. Priority direction should be selected; project name should be entered both in Uzbek and Russian; performer organization and organizations – co-executors should be selected, if any; project goals and objectives should be introduced, as well as the problem, that the project manager is going to solve in the project. Manager must also upload the project file with more detailed information about the project.

At the second stage stages of implementation of the project are entered. From the manager it is required to enter demanded resources of fund and other organizations for implementation of this stage of the project.

At the third stage information on performers of the project is filled in. The manager has to specify a full name of the performer, his position in the project and quantity of rates. The total of rates of one person can't exceed two. At this stage search of existing performers in base is realized. If the necessary performer isn't present in a database, the manager can create the new performer.

At the fourth stage from the head it is required to enter the project budget, and on what this money will be spent. At input of the budget of the project the part of the sum which is requested from fund, and the part of the sum allocated by other organizations should be specified.

After input of all necessary information transition to the page of preview of the created demand and after that the demand is added in a database is carried out.

In the following figures 3.7-3.11 pages of creating application for the contests of innovative type of research are given.

The screenshot shows a web application interface for creating an innovative application. The page is titled "Step 1/4 Project information". The interface includes a navigation menu on the left with options like "Home", "Contests", "Contacts", and "About committee". A "Personal menu" is also visible with options such as "My applications", "My projects", "My data", "My publications", "Work places", "Project reports", "Messages", and "Report notifications". The main form area contains the following fields:

- Scientist:** A text field with the value "Шошман Умарович Алишерович".
- Contest:** A dropdown menu with the selected option "Конкурс инновационных проектов".
- Program name:** A dropdown menu with the selected option "Энергетика, энерго-ресурсообер".
- Name (in russian):** A text input field.
- Name (in uzbek):** A text input field.
- Performer organization:** A dropdown menu with the selected option "Физико-технический институт На".
- Organization co-executor:** A dropdown menu with the selected option "Физико-технический институт На".
- Project aims and tasks:** A text input field.
- Problem:** A text input field.
- Project content:** A file upload area with a "Выберите файл" button and a "Файл не выбран" status.

On the right side, there is an "Announcement" section with a message: "Dear users! All who registered and did not receive the activation link, click on the link below! And those who are active, please change your password by logging into your account!" with a "Reactivation" link. Below it, there is a "Welcome to personal cabinet shoxmanager" section with "Logout" and "Change password" links. At the bottom right, there is a "Directions Site:" section.

Figure 3.7. Creating innovative application (The first step).



Figure 3.8. Creating innovative application (The second step).



Figure 3.9. Creating innovative application (The third step).



Figure 3.10. Creating innovative application (The fourth step).

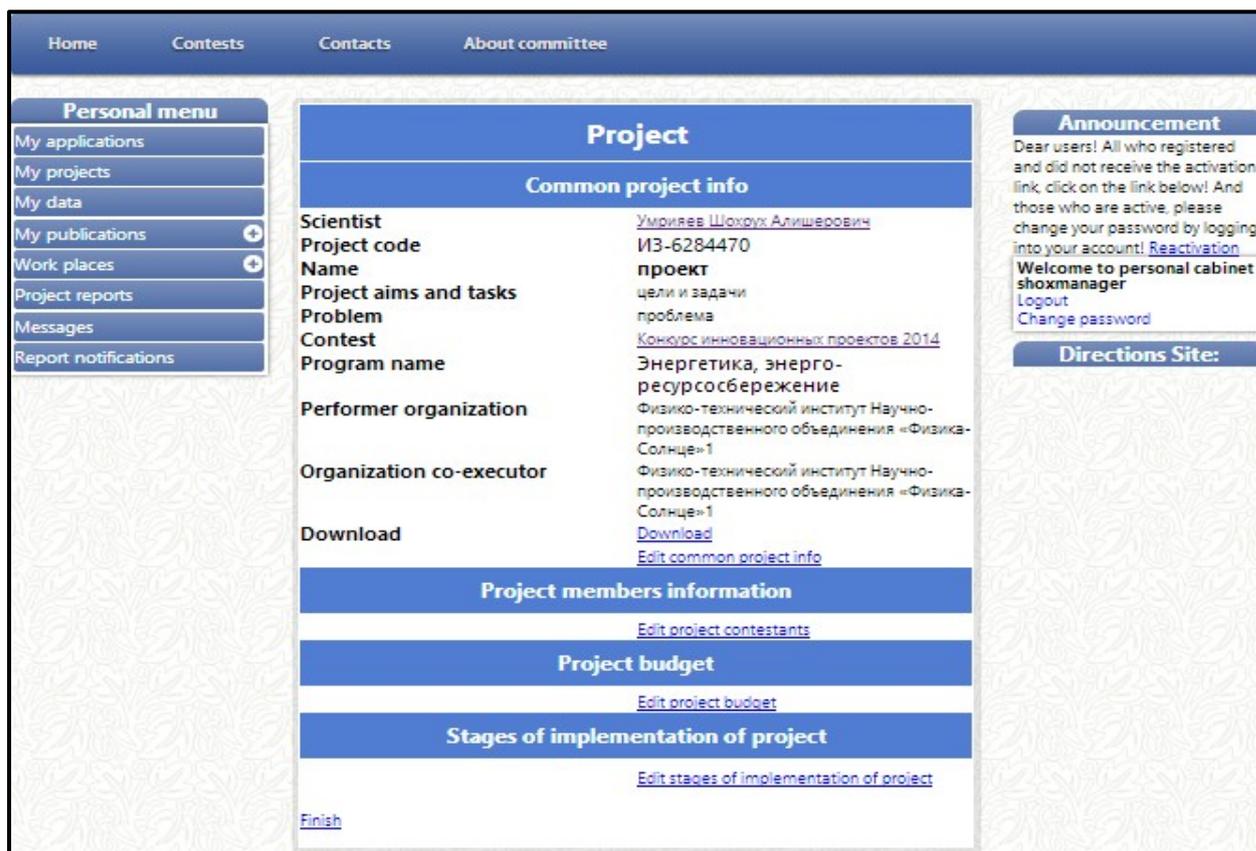


Figure 3.11. Creating innovative application (Preview of the created application).

Scientists registration is divided into two stages. At the first stage information required for the membership in the system should be entered. This information includes username, password, phone number, e-mail address and security question and answer which are required for password recovery.

At the second stage it is necessary to enter information on the scientist. This information includes its address, date of birth, phone number, the date of receipt of scientific degree if such is available, and also a work place, a position and work start date.

Registration finishes with sending the letter with the link of confirmation to mail of the scientist specified at registration.

The scientist has to follow the received link to become the full-fledged user of system.

In the following figures 3.12-3.13 the stages of scientist registration are shown.

Reactivation'. Below the announcement is a 'Log in' section with fields for 'User name' and 'Password', a 'Remember me next time' checkbox, and a 'Log in' button. At the bottom right is a 'Directions Site:' button."/>

Home Contests Contacts About committee

Scientist registration 1/3

Lastname
Firstname
Patronymic
User name
Password
Confirm password
Email:
Phone number
Secret question
Secret answer

Next

Announcement
Dear users! All who registered and did not receive the activation link, click on the link below! And those who are active, please change your password by logging into your account! [Reactivation](#)

Log in
User name
Password
 Remember me next time
Log in

[Registration](#)
[Напомнить пароль](#)

Directions Site:

Figure 3.12. Scientist registration (The first stage).

Reactivation'. Below the announcement is a 'Log in' section with fields for 'User name' and 'Password', a 'Remember me next time' checkbox, and a 'Log in' button. At the bottom right is a 'Directions Site:' button."/>

Home Contests Contacts About committee

Scientist registration 3/3

Work place: Министерство оборона Республики Узб Add
Work start date
Lastname: Тоштемуров
Firstname: Темир
Patronymic: Турсунов
Birthdate
Sex: Non selected
Post: Учитель1
Scientific degree: Доктор наук
Scientific direction: Не выбрано, Социально-гуманитарное1, Медицина, Физико-математические и технические науки, Естественные науки
Date of degree award
VAK speciality code: АВИАЦИЯ ТЕХНИКАСИ(05.07.00)
Number of scientific works
TIN
Work address

e1fd5c Update

Announcement
Dear users! All who registered and did not receive the activation link, click on the link below! And those who are active, please change your password by logging into your account! [Reactivation](#)

Log in
User name
Password
 Remember me next time
Log in

[Registration](#)
[Напомнить пароль](#)

Directions Site:

Figure 3.13. Scientist registration (The second stage).

Chapter three summary

In chapter 3 the following results were gained:

1. The class for display of relational data in objects of system is realized. This class allows accelerating work with a database, to turn attention to logic of the appendix, encapsulating construction and processing of SQL queries.
2. Pages of creation of contests and applications are considered. Information storage in the form of contests, applications and the related references gives the chance of the systematized storage of information and convenient access to it.
3. Registration of scientists is considered. Scientists are one of the main objects of system. Therefore it was important to think over carefully process of registration of the scientist in the system, giving the chance to separate information on membership of the scientist in system from information on the scientist.

CHAPTER 4. LIFE SAFETY

4.1. Hypodynamia and its effect on human health

In ancient times, it was observed that physical activity contributes to a strong and enduring human and immobility leads to a decrease in efficiency, disease and obesity. All this is due to metabolic disorders. Reducing the energy metabolism associated with changing the intensity decay and oxidation of organic substances violates the biosynthesis, as well as to changes in calcium metabolism. As a result, the bones undergo profound changes. First of all, they begin to lose calcium. This leads to the fact that the bone becomes loose and less durable. Calcium enters the bloodstream, is deposited on the walls of blood vessels, they sclerosis, i.e. impregnated with calcium, lose elasticity and made brittle. The ability of blood to clot increases dramatically. This leads to the risk of blood clots (thrombosis) in the blood. The content of calcium in the blood contributes to the formation of kidney stones.

Lack of muscular load reduces the intensity of energy metabolism, affecting the skeletal and cardiac muscles. In addition, a small number of nerve impulses going from the working muscles reduce tone of nervous system, previously acquired skills lost without forming new. All of this has a negative impact on health. You should also take into account the following: A sedentary lifestyle causes the cartilage gradually becomes less elastic, loses flexibility. This can result in reduced amplitude of respiratory movements and loss of flexibility of the body. But especially strongly from immobility or small mobility affects the joints.

Nature of motion in the joint defined its structure. The leg at the knee joint can only bend and extend while the hip joint movements can be performed in all directions. However, the amplitude of motion depends on the workout. In case of insufficient mobility ligaments lose elasticity. In the cavity of a joint motion allocated insufficient synovial fluid acts as a lubricant. All this complicates the work of the joint. Insufficient loading influences and blood circulation in a joint. As a result food of bone fabric is broken, formation of the articulate cartilage covering a head and an articulate hollow of being jointed bones and the bone goes

incorrectly that leads to various diseases. But it is not limited to that. Blood circulation can lead to uneven growth of bone tissue, resulting in a loosening of some sections and seal. The shape of bones as a result of this could be wrong, and joints lose mobility.



Figure 4.1. Effect of hypodynamia on human health

Hypodynamia is the weakness of the muscle tissues that occurs due to the very small motor activity. Modern man with all the blessings of civilization: cars, shops at every turn, sedentary work, the Internet. All of this, of course, good, but the problem is for the human body the sedentary life is like death. Indeed, the very nature inherent that we have to move a lot and actively.

On the other hand, one should not think that if you do 50 push-ups every day, or 100 times the exercise, that will be enough for the body. The fact of the matter is that when the muscles are constantly working in the same mode, perform the same daily (let's say you each day climb to 12 floor walk), this kind of restricted movements eventually will lead to hypodynamia too.

How to recognize hypodynamia?

1. If your muscles are insufficiently often reduced, that, on the nature idea, "unnecessary" bodies will atrophy. Certainly, it takes a time, therefore, as soon as you noticed that simple actions (for example to pass on foot two quarters), which causes you have short wind and pain in the legs, it is necessary

to sound an alarm – a hypodynamia is nearby! After all, the hypodynamia and health of the person are linked inseparably.

2. If your weight is continuously growing, it means that the body isn't getting adequate physical activity. And the calories reserved by it for muscular exertion, instead turning into fat. The metabolism is thus slowed down, and forms "creep away" even quicker.
3. You are constantly drawn to the fridge, although it would seem, the dinner was not so long ago? You'd be surprised, but it is also an indirect sign of hypodynamia. The fact is that when a person moves a lot, the fats are broken and released into the bloodstream, maintaining it at the desired level of sugar. Therefore, you will not feel hunger and want to eat as much as the body needs for normal functioning. If the motion is small, the blood sugar drops rapidly as a result of weaker people and tries to compensate for the lack of forces through the absorption of fatty and sugary foods.

Hypodynamia and its consequences

Throughout the life of a person is influenced by a variety of factors of external and internal environment. There are a huge number of such factors. However, despite the large number of all of these factors they can be ranked in order of their importance for health. It was done by the World Health Organization. Of the 200 major identified factors that have the most significant influence on the person, the first four places are occupied by hypodynamia (lack of movement), unhealthy diet (and, above all, overweight), bad habits (consumption of alcohol, drugs and other substances) and unfavourable environmental conditions.

The existing system of education is not only not conducive to improving the health of students, but often requires a huge amount of movements for their development, not less than 50-60% of the time in a day should be allocated to motor activity.

However, the need to move from the independent movement of students satisfied only by 8-20%.

Numerous studies show that the current system of physical education and the program does not contribute to the harmonious development of children and adolescents in need of improvement, new solutions, and optimal impact of all forms, tools and methods in order to preserve and promote the health of students.

For diseases associated with hypokinesia include cardiovascular, neurological, gastrointestinal disorders, bone, muscle and cartilage changes, etc.

How to deal with hypodynamia?

As you can see, the impact of physical inactivity on the man hard enough and detrimental to him. But deal with it can and should be. The main enemies of inactivity are a variety of regular exercise. That requires daily charging and walking, you've probably already guessed it. But there is another effective remedy for this disease which is called isometric exercises. These exercises are convenient in that they are almost invisible to outsiders and therefore they can be done anywhere. Moreover, they are based on strong muscle tension, and repeating them only once a day, you can be sure that the necessary muscular load is obtained. So here they are:

- Stretch your arms, press your fingers into the surface of the table half-bent. Breathing heavily, breathing out gently but strongly push your fingers into the table. Pressure should be approximately 5-6 seconds and then relax. Rest 30 seconds, then repeat the exercise.
- Palm off hands under a table and with the back party of palms with a force push a table cover up. Push to 5-6 seconds, over half a minute.
- Clasp hands behind the neck, try to bend it forward, while resisting all the muscles of the neck. "Fight" 10 seconds, repeat after 30 seconds.
- Sit on a chair, hold its legs with your feet, straining legs squeeze as much as possible. Compress to 10 seconds every half minute.
- Clasp your hands outstretched arms into the lock, and without bending the arms, try to unlock them. Repeat after half a minute rest.

As can be seen, the prevention of hypodynamia is quite simple, and following these simple recommendations, you will soon be able to say goodbye to this ailment.

4.2. Safety precautions when working on PC.

So far, among the users of personal computers (PCs), as well as manufacturers of computer equipment, there is no consensus about whether the harmful, and if so, to what extent is harmful to the human body communication with your computer. On the one hand, mass printing periodically publish articles that warn that the PC almost deadly. On the other hand, there are detailed reports on how one or another computer firm achieves its transformation products in a safe health tool.

Environmental problems of computerization consists of two components. First is determined by the physiological features of the human computer. Second is technical parameters of means of computerization. These "human" and "technical" components are closely intertwined and interdependent. Studies of such problems are the subject of the science of human interaction, whose main aim is to create a perfect and safe equipment, the maximum human-oriented, organization of work, prevention work.

Negative computer impacts on human health

Many people, who are constantly working with the computer, note that often in a short time after starting work there is a headache, pain in the muscles of the face and neck, aching back pain, pain in the eyes, watery eyes, violation of a clear vision, pain when moving hands. The degree of pain sensation is proportional to the time for the work PC.

Table 4.1

Negative computer impacts on human health

Symptoms of exposure	Percent of operators who reported on symptoms of working at the computer:
----------------------	---

	up to 1 year (partial shift)	up to 1 year (full change)	more than 1 year	more than 2 years
Headache and pain in the eyes	8	35	51	76
Exhaustion, dizziness	5	32	41	69
Violation of nighttime sleep	-	8	15	50
Sleepiness during the day	11	22	48	76
Changes in mood	8	24	27	50
Increased irritability	3	11	22	51
Depression	3	16	22	50
Reduced intellectual ability, memory impairment	-	3	12	40
Tension of the skin of the forehead and head	3	5	13	19
Hair loss	-	-	3	5
Muscle pain	11	14	21	32
Pain in the heart, uneven heartbeat, shortness of breath	-	5	7	32
Decreased sexual activity	12	18	34	64

Computer's negative impact on the human is complex, and therefore the study of the impact of computer technology should be integrated, interrelated influence of many factors. Only a comprehensive approach can reliably assess computer's impact on the health of the user.

Computer radiation

When all PC devices are switched on, around a workplace of the operator the electromagnetic field difficult on structure is formed. Real threat for the user of the computer is posed by electromagnetic fields. As showed results of numerous

scientific works, the personal computer monitor is a source of the following types of radiation:

- electrostatic field;
- weak electromagnetic radiation in the low-frequency and high-frequency ranges (2Hz – 400kHz);
- x-ray;
- UV;
- infrared radiation;
- visible radiation.

Their influence on the human organism is unclear, but it is clear that it is not without consequences. Studies of the functional State of PC users, conducted by the Center for electromagnetic safety, have shown that in humans under the influence of electromagnetic radiation of the monitor there are major changes in hormonal condition, specific changes in brain, changing of low metabolism. Low-frequency electromagnetic fields at interaction with other negative factors can initiate cancer diseases and leukemia. The dust attracted by an electrostatic field of the monitor sometimes becomes the reason of dermatitis of the person, an aggravation of asthmatic symptoms, irritations of mucous membranes.

Computer vision syndrome

Human sight isn't adapted for the computer screen, we got used to see colors and subjects in reflected light that was developed in the course of evolution. The self-shining screen image has considerably smaller contrast and consists of discrete points – pixels. The exhaustion of eyes causes screen blinking, patches of light, and a non-optimal combination of colors under review.

As a prophylactic measure specially designed glasses for PC should be used. Computer glasses protect the eyes from the adverse effects of the monitor. They increase the clarity of perception, optimize color, reduce eye fatigue, improve comfort and performance.

Problems associated with muscles and joints

The largest numbers of health complaints of the people who earn their living working on computers are associated with diseases of the muscles and joints.

The motionless intense pose of the operator for a long time chained to the screen of the monitor, leads to fatigue and emergence of pains in a backbone, a neck, humeral joints, and also muscular weakness develops and there is a change of a shape of a backbone. The hard work with the keyboard causes painful feelings in elbow joints, forearms, wrists, in brushes and fingers of hands.

Often there are complaints to a neck sleep, shoulder and waist pain or a pricking at feet. But happen, however, more serious diseases. The hand tunnel syndrome at which nerves of a hand are injured owing to frequent and long work on the computer is most widespread. In the heaviest form this syndrome is shown in the form of the painful pains depriving the person of working capacity.

Computer stress syndrome

There is evidence that regular users of the PC more and more exposed to psychological stress, functional disorders of the central nervous system, and diseases of the cardiovascular system. According to the research we can draw conclusions about the likelihood of hormonal changes and violations of human immune status.

Against this background, the medical community has identified a new type of disease - computer stress syndrome.

Symptoms are varied and numerous. Typically, the presence of a single symptom is unlikely as all functional human organs are interconnected.

Physical ailments: drowsiness; not passing fatigue; headaches after work; pain in the lower back and legs; tingling, numbness, pain in the arms; muscle tension of the upper body.

Diseases of the eye: a sense of acute pain, burning, itching.

Violation of visual perception: blurred vision, which increases during the day; occurrence of double vision.

Deterioration of concentration and efficiency: concentration is achieved with difficulty; irritability during and after operation; loss of the operating point on the screen; errors when typing.

There is an opinion that by an exception of negative factors of influence it is possible to reduce probability of emergence of the computer stress syndrome to a minimum.

Organization of a workplace and safety standards

Specialists in different areas and specializations after thorough investigations have concluded that the cause of variances health users are not so much computers as insufficiently strict observance of the principles of ergonomics. Scientists are concerned that the emergence and active use of computer technology did not become an additional factor of deteriorating health. This requires that the job would be in keeping with the hygienic requirements of security.

The figure shows a system of interaction between human, machine and user environment.

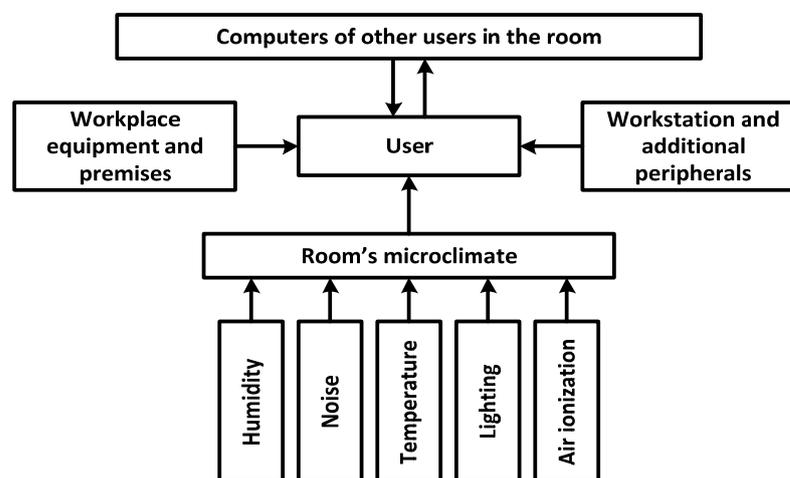


Figure 4.2. System of interaction between human, machine and user environment

Based on this system of interaction, we formulate the basic requirements for the organization of the workplace and working process, which will help reduce the impact of harmful factors from the PC.

In areas where computers are used specific environmental climate is formed. At low values of moisture in the air with high micro particles accumulate electrostatic charge capable of adsorbing the dust particles and hence have allergenic properties. To maintain proper temperature and relative humidity needs regular airing, as well as the presence of ionic systems and air conditioning systems. To improve the microclimate competent organization of lighting is also important. Experts recommend using mainly fluorescent lamps. They are arranged in the form of continuous or broken lines located on the side of jobs, parallel to the line of monitors. When computers are located on the perimeter lights should be localized above the working place towards the front, facing towards the user. There are special fluorescent lamps that emit light of different quality, simulating thus, a full spectrum of natural sunlight.

Another equally serious problem-ensuring of electromagnetic safety working at your computer with additional peripherals. While their inclusion creates a field around the user with a wide frequency spectrum.

In this case the equipment plays an important role in the workplace. However, in practice, ensure normal electromagnetic environment is not always the case. Experts offer to take into account the following:

- room where computers and their peripherals are being operated should be removed from extraneous sources of electromagnetic radiation;
- if there are metal grates placed Windows, they should be grounded, because failure to do so could lead to a sharp local field enhancement in any point of the room and your computer crash;
- it is desirable to place work place on the lower floors of the building, as due to the minimum grounding resistance is on the lower floors of the building, thus, overall electromagnetic background will be significantly reduced.

When incorrect overall layout premises wiring mains are suboptimal and device circuit grounding is inefficient own electromagnetic background space can

be so strong that provide workplace requirements of sanitary regulations in most cases impossible.

Particular attention should be paid to the organization of group jobs , as in this case, the user is exposed to radiation not from only his computer , but also those who are close to him. Every workplace creates a kind of magnetic field, the radius of which can be 1.5 m or more, and the radiation comes not only from the screen, but also on the back and sides of the monitor. Experts advise to post jobs with computers so that the distance between the side walls of adjacent monitors display was not less than 1.2 m, and the distance between the front surface of the monitor toward the rear of the neighboring monitor - not less than 2 m This layout jobs helps to protect the user from EMI neighboring computers.

CONCLUSION

Sphere of scientific research and scientific competitions that attract more and more information and telecommunication technologies and automate all processes starting with news alerts and ending with the final processing of the collected data, are a clear example of the improvement of human activities through the introduction of information technologies.

In this final qualification work on "«Ilmiy Ishlar»: Development of subsystems for systematization and storage of data on conducted research studies" subsystems for systemizing and storing information for the system "Ilmiy Ishlar" were developed.

Based on the work performed and the above presented material the following results were gained:

- Study of subject area
- Formulation of the statement of the problem
- A description of the IS "Ilmiy Ishlar"
- Developed systematization subsystem
- Developed data storage and retrieve subsystem
- Given registration, contest creation and submitting application for contests processes.
- Considered life safety

This information system is aimed at scientists and organizations where these scientists execute research projects. With the help of this system scientists based in different parts of our country can participate in contests of scientific projects, send reports to their projects, exchange messages with the operators of the system and add information about their scientific publications.

As a further improvement of the IS given the opportunity to develop modules to improve the IS. It is also possible revision of the IS interface for further enhance of its informativeness, attractiveness and convenience.

BIBLIOGRAPHY

1. Указ Президента РУз от 30 мая 2013 г. «О дальнейшем развитии компьютеризации и внедрении информационно-коммуникационных технологий»;
2. Постановление Президента Республики Узбекистан от 21 марта 2012 года «О мерах по дальнейшему внедрению и развитию современных информационно-коммуникационных технологий»;
3. Ребекка М. Райордан «Основы реляционных баз данных» изд. «Русская редакция» 2001г.-390с.;
4. Стив Макконнелл «Совершенный код» изд. «Питер» 2005г.-893с.;
5. Joseph Sack «SQL Server 2005 T-SQL recipes», «Apress» 2006.-769p.;
6. Martin Fowler «Patterns of Enterprise applications architecture», «Williams» 2006.-541p.;
7. Matthew MacDonald, Adam Freeman, Mario Szpuszta –«Pro ASP .NET 4 in C # 2010 for professionals», «Apress» 2011.-1418p.;
8. Andrew Troelsen- «Pro C# 5.0 and the .NET 4.5 framework 6th edition», «Apress» 2012.-1534p.;
9. <http://новыйспособ.рф/методы-систематизации-информации> – систематизация информации
10. <http://uzscience.uz/index.php/ru/2011-10-29-11-21-28> - О деятельности Комитета по координации развития науки и технологий
11. [http://msdn2.microsoft.com/en-us/library/7h3ystb6\(VS.80\).aspx](http://msdn2.microsoft.com/en-us/library/7h3ystb6(VS.80).aspx), .NET Web Service Description Language Tool;
12. http://en.wikipedia.org/wiki/object-relational_mapping - Object-relational mapping
13. http://en.wikipedia.org/wiki/Entity%E2%80%93relationship_model – Entity relationship model

APPENDIXES

APPENDIX B

Relational database model for the system “Ilmiy Ishlar”

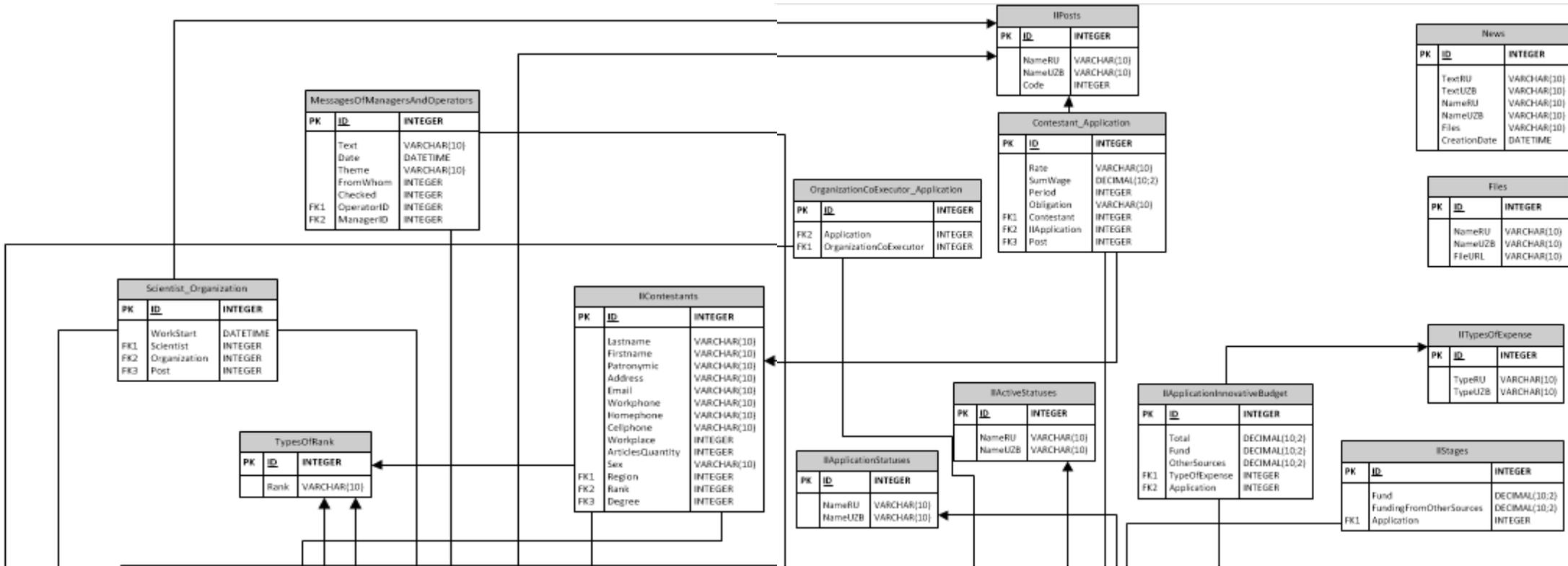


Figure B-1. Relational model of the database of “Ilmiy Ishlar” system

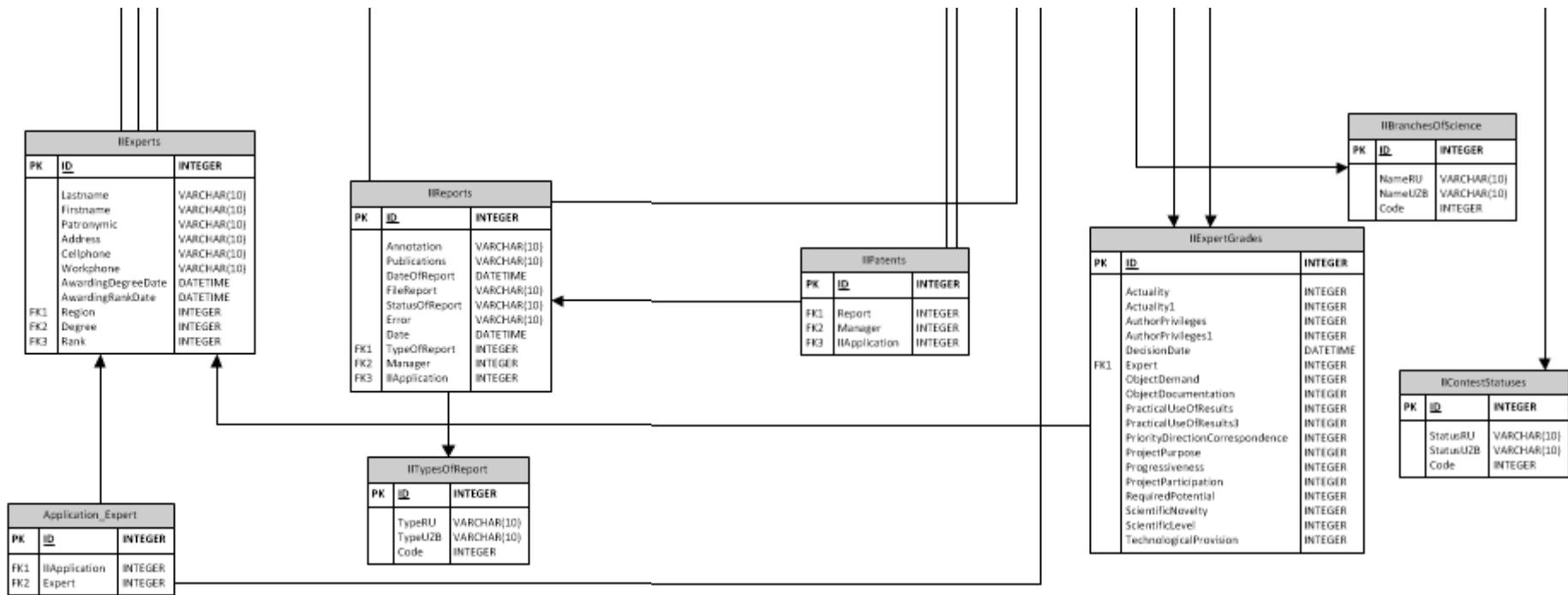


Figure B-3. Relational model of the database of “Ilmiy Ishlar” system

APPENDIX C

Object model of the system “Ilmiy Ishlar”



Figure C-1. Classes of business logic

The image displays a collection of class definitions for business logic, organized into several columns. Each class is shown in a separate window, detailing its fields, properties, and methods.

- ScientificSpecialty**: Fields include _code, _direction, _id, and _specialty. Properties include Code, Direction, GetDirection, ID, and ScecialityWhisC... Methods include Speciality.
- IIApplicationInn...**: Fields include _application, _fund, _id, _otherSources, _total, and _typeOfExpense. Properties include Application, Fund, ID, OtherSources, Total, and TypeOfExpense. Methods include GetTypeOfExpe...
- IIApplicationInn...**: Fields include _id, _iiApplicationInn..., _iiContestantIn..., _obligation, _period, and _sumWage. Properties include FIO, ID, IIApplicationInn..., IIContestantInn..., Obligation, Period, and SumWage.
- IIApplicationOr...**: Fields include _application, _id, and _organizationC... Properties include Application, ID, NameOrganiza..., and OrganizationCo...
- IIApplicationSta...**: Fields include _id, _nameRU, and _nameUZB. Properties include ID, NameRU, and NameUZB.
- RoleUser**: Fields include _id, _roleName, and _username. Properties include ID, RoleName, and Username.
- UserScientist**: Fields include _email, _id, _isActivated, _password, _passwordAns..., _passwordQues..., _scientistID, and _username. Properties include Email, ID, IsActivated, Password, PasswordAnswer, PasswordQuest..., Phone, ScientistID, and Username. Methods include CheckUser and IsUserScientistE...
- TypesOfDecision**: Fields include _id and _type. Properties include ID and Type.
- News**: Fields include _creationDate, _files, _id, _nameRU, _nameUZB, _textRU, and _textUZB. Properties include CreationDate, Files, ID, NameRU, NameUZB, ShortCreationD..., TextRU, and TextUZB.
- TypesOfOrganiz...**: Fields include _id and _type. Properties include ID and Type.
- ScientistOrganiz...**: Fields include _id, _organization, _post, _scientist, and _workStart. Properties include ID, Organization, OrganizationN..., Post, PostName, Scientist, WorkStart, and WorkStartShort.
- IIPosts**: Fields include _code, _id, _nameRU, and _nameUZB. Properties include Code, ID, NameRU, and NameUZB.
- IIIPatent**: Fields include _id, _iiApplication, _manager, and _report. Properties include ID, IIApplication, Manager, and Report.
- Degree_Direction**: Fields include _degree, _direction, and _id. Properties include Degree, Direction, and ID. Methods include GetDegree and GetDirection.
- EncryptDecrypt...**: Fields include encryptionKey, IV, and key. Properties include encryptionKey, IV, and key. Methods include Decrypt and Encrypt.
- IIApplicationOr...**: Fields include _application, _id, and _organizationC... Properties include Application, ID, NameOrganiza..., and OrganizationCo...
- IIApplicationSta...**: Fields include _id, _nameRU, and _nameUZB. Properties include ID, NameRU, and NameUZB.
- ScientistByOrga...**: Fields include _averageAge, _numberOfCands, _numberOfDocs, _numberOfMen, _numberOfScie..., _numberOfWo..., and _organization. Properties include AverageAge, NumberOfCands, NumberOfDocs, NumberOfMen, NumberOfScie..., NumberOfWo..., and Organization. Methods include GetPerformerO... and GetPriorityDire...

Figure C-3. Classes of business logic

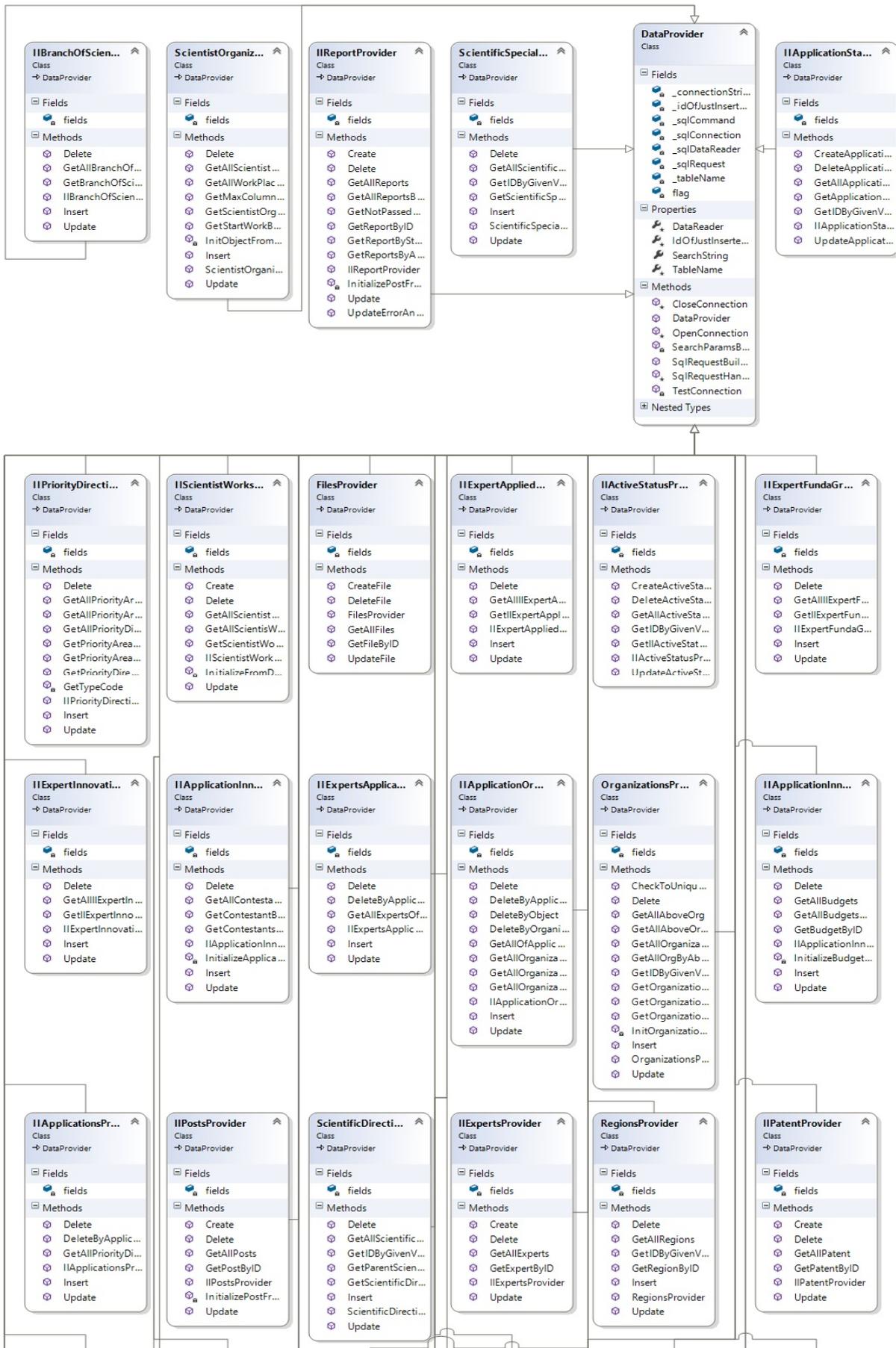


Figure C-4. Classes of object-relational representation

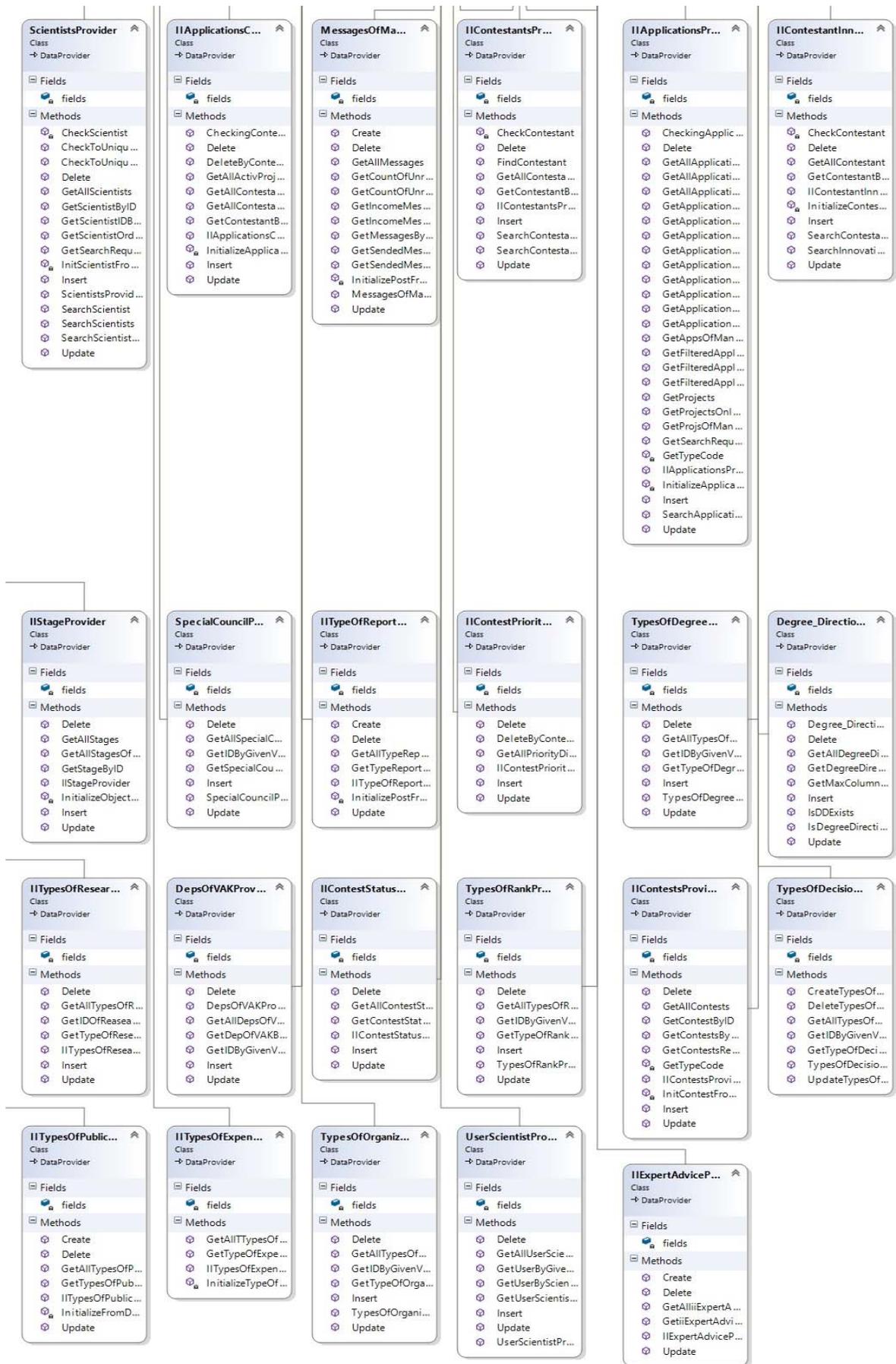


Figure C-5. Classes of object-relational representation

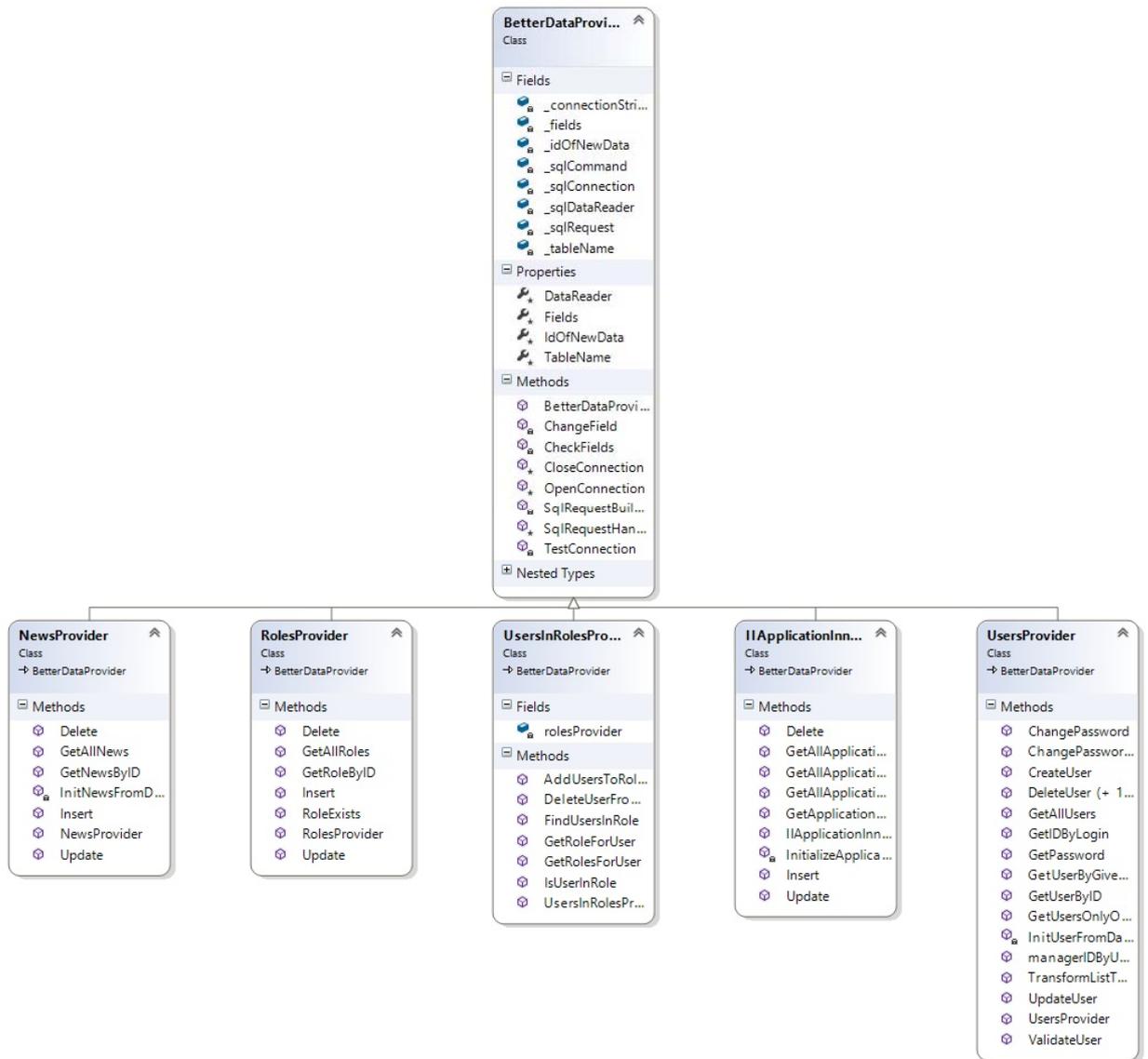


Figure C-6. Classes of object-relational representation

APPENDIX D

DataProvider class listing

```
public class DataProvider
{
    #region Fields
    private string _connectionString;
    private string _tableName = null;
    private SqlConnection _sqlConnection;
    private SqlCommand _sqlCommand;
    private string _sqlRequest;
    private SqlDataReader _sqlDataReader;
    private int _idOfJustInsertedRow;
    #endregion

    #region Properties
    protected int IdOfJustInsertedRow
    {
        get { return this._idOfJustInsertedRow; }
    }
    protected string TableName
    {
        get { return _tableName; }
        set { _tableName = value; }
    }
    protected SqlDataReader DataReader
    {
        get { return _sqlDataReader; }
    }
    #endregion

    private bool TestConnection(string connectionString)
    {
        try
        {
            using (var connection = new SqlConnection(connectionString))
            {
                connection.Open();
                return true;
            }
        }
        catch
        {
            return false;
        }
    }

    protected string SqlRequestBuilder(SqlRequestType sqlRequestType,
        List<string> fields = null,
        List<object> values = null,
        string nameOrderingBy = null,
        List<FilterValue> filterVals = null,
        string delimiter="and")
    {
        string sqlRequest = "";
        switch (sqlRequestType)
        {
            case SqlRequestType.Max:

```

```

        sqlRequest = string.Format("Select max({0}) as maxValueOf{1}Column
from {2}", values[values.Count - 1], values[values.Count - 1], _tableName);
        break;

    case SqlRequestType.Create:
        sqlRequest = string.Format("Insert into {0}(", _tableName);
        for (int counter = 0; counter < values.Count; counter++)
        {
            sqlRequest += " " + fields[counter] + ",";
        }
        sqlRequest = sqlRequest.Remove(sqlRequest.Length - 1, 1);
        sqlRequest += ") values( ";
        for (int counter = 0; counter < values.Count; counter++)
        {
            sqlRequest += " @" + fields[counter] + ",";
        }
        sqlRequest = sqlRequest.Remove(sqlRequest.Length - 1, 1);
        sqlRequest += ");";
        sqlRequest += " select cast(scope_identity() as int)";
        break;

    case SqlRequestType.Update:
        sqlRequest = string.Format("Update {0} set", _tableName);

        for (int counter = 0; counter < fields.Count - 1; counter++)
        {
            sqlRequest += string.Format(" {0}=@{1}", fields[counter],
fields[counter]) + ",";
        }
        sqlRequest = sqlRequest.Remove(sqlRequest.Length - 1, 1);
        sqlRequest += " where ID=@ID";
        break;

    case SqlRequestType.Delete:
        sqlRequest = string.Format("Delete from {0} where ", _tableName);
        sqlRequest += string.Format("{0}=@{1}", fields[fields.Count - 1],
fields[fields.Count - 1]);
        break;

    case SqlRequestType.Read:
        sqlRequest = "Select ";
        if (fields == null)
            sqlRequest += string.Format(" * from {0}", this._tableName);
        else
        {
            for (int counter = 0; counter < fields.Count; counter++)
            {
                sqlRequest += string.Format(" {0},", fields[counter]);
            }
            sqlRequest = sqlRequest.Remove(sqlRequest.Length - 1, 1);
            sqlRequest += string.Format(" from {0}", _tableName);
        }
        if (values != null)
        {
            sqlRequest += string.Format(" where {0}=@{1}",
fields[fields.Count - 1], fields[fields.Count - 1]);
        }
        if (nameOrderingBy != null)
        {
            sqlRequest += string.Format(" ORDER BY {0}", nameOrderingBy);
        }
        break;
    case SqlRequestType.Search:
        if (fields == null)

```

```

        sqlRequest = string.Format("Select * from {0} where {1}",
            _tableName, SearchParamsBuilder(filterVals, delimiter));
        else
            sqlRequest = string.Format("Select {0} from {1} where {2}",
                fields[0], _tableName, (SearchParamsBuilder(filterVals, delimiter)));
            break;
    }
    return sqlRequest;
}

protected void SqlRequestHandler(SqlRequestType sqlRequestType,
    List<string> fields = null,
    List<object> values = null,
    string nameOrderingBy = null,
    List<FilterValue> filterVals = null)
{
    if (!flag)
        this._sqlRequest = this.SqlRequestBuilder(sqlRequestType, fields, values,
            nameOrderingBy);

    switch (sqlRequestType)
    {
        case SqlRequestType.Max:
            this._sqlCommand.CommandText = _sqlRequest;
            this._sqlCommand.Parameters.Clear();
            break;

        case SqlRequestType.Create:
            this._sqlCommand.CommandText = _sqlRequest;
            this._sqlCommand.Parameters.Clear();
            for (int counter = 0; counter < values.Count; counter++)
            {
                if (values[counter] != null)
                    this._sqlCommand.Parameters.Add(new
                        SqlParameter(string.Format("@{0}", fields[counter]), values[counter]));
                else
                    this._sqlCommand.Parameters.Add(new
                        SqlParameter(string.Format("@{0}", fields[counter]), DBNull.Value));
            }
            break;

        case SqlRequestType.Update:
            this._sqlCommand.CommandText = _sqlRequest;
            this._sqlCommand.Parameters.Clear();
            for (int counter = 0; counter < fields.Count; counter++)
            {
                if (values[counter] != null)
                    this._sqlCommand.Parameters.Add(new
                        SqlParameter(string.Format("@{0}", fields[counter]), values[counter]));
                else
                    this._sqlCommand.Parameters.Add(new
                        SqlParameter(string.Format("@{0}", fields[counter]), DBNull.Value));
            }
            break;

        case SqlRequestType.Delete:
            this._sqlCommand.CommandText = _sqlRequest;
            this._sqlCommand.Parameters.Clear();
    }
}

```

```

        this._sqlCommand.Parameters.Add(new
SqlParameter(string.Format("@{0}", fields[fields.Count - 1]), values[values.Count - 1]));
        break;

    case SqlRequestType.Read:
        if (values != null)
        {
            this._sqlCommand.CommandText = _sqlRequest;
            this._sqlCommand.Parameters.Clear();
            this._sqlCommand.Parameters.Add(new
SqlParameter(string.Format("@{0}", fields[fields.Count - 1]), values[values.Count - 1]));
        }
        else
            this._sqlCommand.CommandText = this._sqlRequest;

        break;
    case SqlRequestType.Search:
        this._sqlCommand.CommandText = this._sqlRequest;
        this._sqlCommand.Parameters.Clear();
        break;

}

try
{
    OpenConnection();
    switch (sqlRequestType)
    {
        case SqlRequestType.Read:
        case SqlRequestType.Max:
        case SqlRequestType.Search:
            this._sqlDataReader = _sqlCommand.ExecuteReader();
            break;

        case SqlRequestType.Create:
            this._idOfJustInsertedRow =
(int)this._sqlCommand.ExecuteScalar();
            break;
        case SqlRequestType.Update:
        case SqlRequestType.Delete:
            this._sqlCommand.ExecuteNonQuery();
            break;
    }
}
catch (SqlException e)
{
    throw new ApplicationException("Error occured while handling sql request"
                                + "\nException message: "
                                + e.Message);
}

finally
{
}
}

public DataProvider()
{
    this._connectionString =
ConfigurationManager.ConnectionStrings["FANConnectionString2"].ConnectionString;

    this._sqlConnection = new SqlConnection(_connectionString);
}

```

```

        this._sqlCommand = new SqlCommand();
        this._sqlCommand.Connection = SingletonConnection.Instance.Connection;
    }

    protected void OpenConnection()
    {
        if (SingletonConnection.Instance.Connection.State == ConnectionState.Closed)
        {
            SingletonConnection.Instance.Connection.Open();
        }
    }

    protected void CloseConnection()
    {
        if (SingletonConnection.Instance.Connection.State == ConnectionState.Open)
        {
            SingletonConnection.Instance.Connection.Close();
        }
    }
}
#endregion

protected enum SqlRequestType
{
    Create,
    Read,
    Update,
    Delete,
}
}

```