

УДК 372.881.111.1

DOI: 10.25559/SITITO.15.201902.499-506

Ryazan Universities Networking Cooperation: The Theory and Experience of the Organization

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Abstract

The modern priorities in the development of the education system in Russia are shown in the article. The definition of networking cooperation is analyzed, its main characteristics are given. The main network forms of cooperation such as integration of resources in the conditions of chronic shortage of fixed assets; the national educational standard; the emergence of professional communities; integration into global processes; the gradual transition from formal guidelines for the managing education program-target methods of management; changes in the composition of participants in the management processes and the transition to a multiprofessional cooperative relations are presented. The characteristics of networking cooperation as opposed to non-networking one are shown. The directions and types of networking cooperation in education are mentioned in the article. The types of educational resources, which can be used like a network, are represented by five generalized groups: human resources, information resources, material and technical resources, educational and methodical resources, social resources. Five main characteristics of the network organization are explained in the article. The questions of the organizing Russian universities networking cooperation are described. The example of organizing networking cooperation between the main Ryazan universities on the basis of a specially designed program is given. The initiator of Ryazan universities networking cooperation is Ryazan State Radio Engineering University named after V.F. Utkin. It is planned to create a common network for all leading universities in Ryazan. The existing results are given in the article. The control-flow chart of the subprogram – client work and the control-flow chart of the subprogram – server work are shown in pictures.

Keywords: Information-communicative technologies, networking cooperation, a network, an interaction, a client, a server, an application.

For citation: Kopylova N.A. Ryazan Universities Networking Cooperation: The Theory and Experience of the Organization. *Sovremennye informacionnye tehnologii i IT-obrazovanie* = Modern Information Technologies and IT-Education. 2019; 15(2):499-506. DOI: 10.25559/SITITO.15.201902.499-506

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Сетевое взаимодействие вузов Рязани: теория и опыт организации

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Аннотация

Современные приоритеты развития системы высшего образования в России представлены в статье. Проанализировано определение сетевого взаимодействия, даны его основные характеристики. Представлены основные сетевые формы взаимодействия: укрупнение ресурсов в условиях хронического дефицита основных средств; национальный образовательный стандарт; появление профессиональных сообществ; интеграция в глобальные процессы; постепенный переход от формальных установок на управление образованием к программно-целевым методам управления; изменение состава участников процессов управления и обозначившийся переход к полипрофессиональным кооперативным связям. Представлены мнения ученых о сетевом и несетевом взаимодействии. В статье рассмотрены основные направления и типы сетевого взаимодействия. Типы образовательных ресурсов, которые используются в качестве сети, представлены пятью обобщенными группами: кадровые ресурсы, информационные ресурсы, материально-технические ресурсы, учебно-методические ресурсы, социальные ресурсы. В статье раскрыты пять основных характеристик сетевой организации. В статье рассматриваются вопросы, связанные с организацией сетевого взаимодействия вузов России, приводится пример организации сетевого взаимодействия основных вузов города Рязани на основе специально разработанной программы. Инициатором сетевого взаимодействия рязанских вузов выступил Рязанский государственный радиотехнический университет имени В.Ф. Уткина. Планируется создать общую сеть всех лидирующих университетов г. Рязани. В статье представлены существующие результаты. Блок-схема алгоритма работы подпрограммы – клиент и блок-схема алгоритма работы подпрограммы – сервер представлены на рисунках.

Ключевые слова: информационно-коммуникативные технологии, сетевое взаимодействие, сеть, взаимодействие, клиент, сервер, приложение.

Для цитирования: Копылова Н.А. Сетевое взаимодействие вузов Рязани: теория и опыт организации // Современные информационные технологии и ИТ-образование. 2019. Т. 15, № 2. С. 499-506. DOI: 10.25559/SITITO.15.201902.499-506



Introduction

In modern possibilities, the sociocultural conditioning of education leads to the need to search for scientifically substantiated ways of updating all components of education, as well as the activities of subjects, which are clearly indicated in the new version of Federal Law No. 273-FZ of December 29, 2012 «About Education in the Russian Federation».

- The effectiveness of innovative processes in the educational environment of this or that region of our country is largely determined by the readiness of educational institutions to follow modern priorities in the development of the higher educational system [ensuring the openness of educational institutions];
- developing of democratic, state-public nature of educational institutions' management;
- strengthening the social partnership of the school and society;
- implementing new approaches to the selection of the education content to achieve its new quality;
- improving the educational process and updating the system for assessing students' achievements.

Purpose

The purpose of the article is to define networking cooperation and to describe the experience of networking cooperation of Ryazan universities.

Main Part

At present, networking cooperation in our country is becoming a modern highly effective innovative technology that allows educational institutions not only to survive, but also to develop dynamically.

– In the education sector, networking cooperation is thought as horizontal interaction between educational institutions for the dissemination of functionality and resources, and is considered as «a system of links that allow to develop, test and offer professional pedagogical community innovative models of education content and management of the education system, this is a way of working on the sharing of resources» [integration of resources in the conditions of chronic shortage of fixed assets;

- the national educational standard;
- the emergence of professional communities;
- integration into global processes;
- the gradual transition from formal guidelines for the managing education program-target methods of management;
- changes in the composition of participants in the management processes and the transition to a multiprofessional cooperative relations [international,
- Russian,
- regional,
- inter - University
- intra-University.

The types of interaction are:

- mutual information,
- coordination,
- joint activities,
- mutual exchange,
- mutual assistance,

- mutual training,
- mutual support,
- technological support, etc.

The content of the cooperation depends on the diversity of professional activities and the specificity of the relevant structural units.

The types of educational resources, which can be used like a network, are represented by five generalized groups:

Human resources:

- highly qualified teachers and masters of industrial training, owning modern production and teaching technologies;
- experts in educational technology, teaching methods, special methods in training technical focus,
- experts in the field of evaluation of professional qualifications.

Information resources:

- databases which accumulate the information about the latest production technologies, trends and developments in the technical areas of goods and services' production, labor markets of technical orientation specialists and trends of their development, changes in the requirements for employers to the quality of training in this segment of the labor market;
- electronic libraries;
- multimedia products, etc.

Material and technical resources: laboratory facilities, specialized premises (workshops and landfills), training and production equipment, tools and materials, including real production equipment used for educational purposes, as well as training equipment analogues (computer models, training apparatus, simulators, etc.).

Educational and methodical resources:

- basic and additional professional educational programs, professional modules on modern production technologies and methods of their development;
- methodical materials (manuals, recommendations for teachers and students, etc.);
- diagnostic tools for assessing the level of learning material;
- computer training and diagnostic programs.

Social resources:

- established partnerships with enterprises and organizations of the region economy real sector;
- "horizontal" connections in the professional pedagogical community of the region;
- links with public associations and non-profit organizations that express the interests of employers in this segment of the labor market, professional communities, etc.

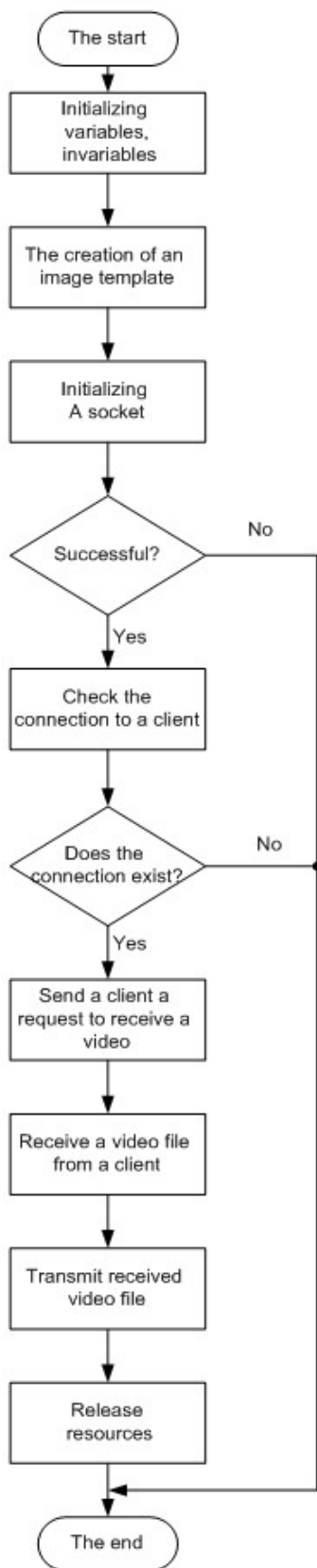
The network organization of educational resources available in separate units of the network, other educational institutions on the basis of mutually beneficial agreements, is one of the strategic solutions in the modernization of regional systems of vocational education.

Nowadays the issues related with the creation of educational institutions' network are relevant. Many schools, universities, educational institutions of additional education seek to create a unified system of such organizations. M.M. Chuchkevich identifies five main characteristics of the network organization [22; 23]:

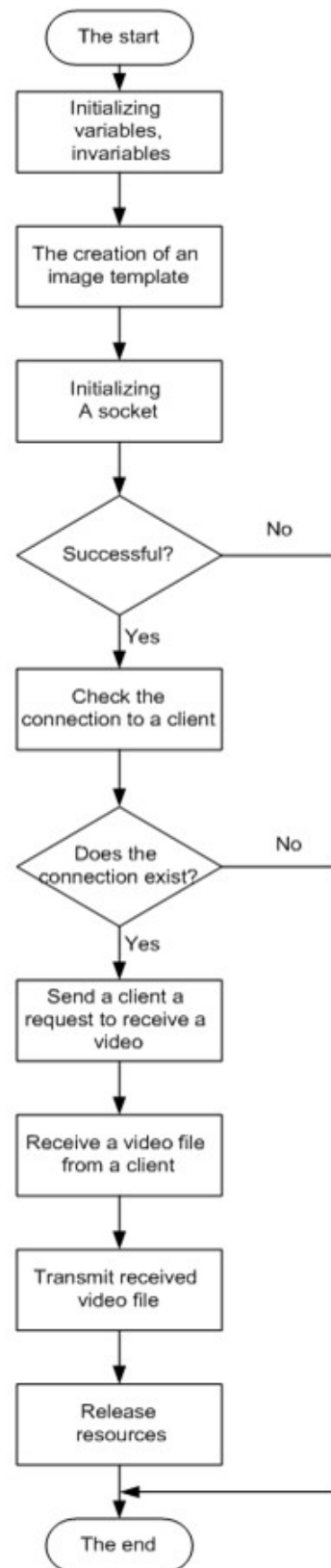
1. Independence of networking members – members have a certain degree of freedom, sufficient to be able to prioritize the nature and direction of their own activities and be responsible for the end result.

2. The plurality of leaders – the concept of leadership in the network





F i g. 1. The control-flow chart of the subprogram-client work



F i g. 2. The control-flow chart of the subprogram-server work



does not coincide with the concept of leadership in organizations built on the principle of administrative hierarchy. A leader in a networking organization is a person or a company that is a carrier of financial, production, communicational, expert or any other resource.

3. Unifying goal – in network organizations it is a fairly complex phenomenon, which carries the meaning of the functional core ideologemes of the network-competitive cooperation.

4. Voluntary communication – it takes different forms depending on the type of a network organization and the degree of its members' independence.

5. Multiple levels of interaction – interaction within the network is carried out not through administrative channels, and directly, between those companies and people who should really solve the necessary issues together.

Using the capabilities of the Internet and ICT tools significantly expands the productivity of networking cooperation. With the traditional organization of methodical work, all teachers in a certain community are familiar with each other, directly in contact with each other. Such direct long-term relationships are minimal, as a result of which such cooperation exhausts itself and becomes unproductive, since limited communication possibilities can not provide the level of information exchange that is necessary for fruitful work. With the networking cooperation, the circle of interaction increases, and, consequently, the results of the work become more productive and qualitative. Due to the networking cooperation, each participant has a unique opportunity to develop and improve their professional key competencies. The participants in the joint activity do not need a synchronous presence in the same place, at the same time, everyone has the opportunity to work with the network resources at a convenient time [24; 25].

Results

The initiator of Ryazan universities networking cooperation is Ryazan State Radio Engineering University named after V.F. Utkin. It is planned to create a common network for all leading universities in Ryazan [26].

To date:

- 1) the structure of the network has been worked out, the main participants have been identified;
- 2) the general principles, goals and tasks of the network functioning are indicated;
- 3) the practical implementation has been started, in particular, software has been developed that implements networking cooperation.

The software is developed in the C++ programming language in the Microsoft Visual Studio 2008 environment. The main purpose of the program is to quickly find the required information about any university in the city and access the files that this university is ready to share (for example, textbooks, reports, articles in electronic formats).

Currently, each institution has its own website on the Internet, which stores all the basic information that may be required, as well as links to download the necessary files. But each university has its own separate site, consisting of many HTML-pages, on which the information is located.

Sometimes to access the necessary information, you have to open 3-4 HTML pages in a row, which can take a long time at a slow Internet connection speed, in addition, each opened page spends

the traffic, and to save it, it would be useful to open the right page at once, without intermediate transitions.

However, in this case it's important to remember or write down URL-addresses of each separate page, which is problematic.

The developed application makes it possible for a user to save time and traffic by giving him convenient and intuitively understandable graphical interface for quick mining of required information.

The developed software gives the opportunity to dispatch to the Internet and watch online translations of conferences, seminars, scientists' councils and so on, conducted in universities, that are the members of the networking cooperation program.

Video files transmission through the Internet and its reception is accomplished by sockets. A socket is a program interface for providing data size between processes. The processes are carried out on different mainframes connected with each other by a network. A socket is an abstract object that is a finite point of connection. Client and server sockets should be divided. Client sockets may be compared with terminal devices of a telephone line, and server ones –with commutator switches. A server broadcasts requests for receiving clients' data, where there are data, that are delivered to a client from the server.

In a program of networking cooperation video files' exchange through the Internet is performed by the a subprogram – client, that is set up on the university computer – a participant and a subprogram – server, set up on the managing computer of the other university – a participant.

The control-flow chart of the subprogram – client work is shown in picture 1.

The control-flow chart of the subprogram – server work is shown in picture 2.

We should note that the client and server applications' codes were written in C++ language in a programming environment Microsoft Visual Studio 2008. For the work with a web-camera the library of a computer vision OpenCV 2.1 was used.

Conclusion

In perspective, it is planned to add the following features into the application of networking cooperation:

- 1) Acquiring access to viewing secured database, containing contact data of all teachers and university employees, taking part in the program of networking cooperation, for creating and strengthening poly-professional corporative connections
- 2) The opportunity for viewing online streams from conferences, seminars through a web-camera, organizing remote discussions through Skype

In conclusion, it is worth noting, that an organization of networking cooperation in universities is connected to its science-technical development, because it requires the latest computer technologies. Therefore, for the successful release of the following project, certain financial support is needed from the side of universities' owners and the ministry of education in Russian Federation. With this in mind, the money spent on the project, apart from the mentioned goals, will also aid in increasing the level of material-technical provision of universities, as well as in improving scientific and educational activities of educational facilities, and in the opening of new courses for these kinds of activities.



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- Submitted 19.03.2019; revised 20.04.2019; published online 25.07.2019.

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The author has read and approved the final manuscript.

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Поступила 19.03.2019; принята к публикации 20.04.2019;
опубликована онлайн 25.07.2019.

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