



Nizhni Novgorod State University
Faculty of Computational Mathematics &
Cybernetics

Innovative Forms of Collaboration
between Universities and IT Companies

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UNN: General Overview...

NIZHNI NOVGOROD

Nizhni Novgorod is the capital of the Volga Federal District (7% of Russia's territory, 22% of its population).

Russia's "Third capital"



Nizhni Novgorod was founded in 1221 by Prince Yuri Vsevolodovich

UNN: General Overview...

University of Nizhni Novgorod

www.unn.ru

UNN is the **first state university**, organized in the Soviet Union (1918). Nowadays, by official rating of the Ministry of Education, UNN is **among top 10 universities in Russia**

- 27 faculties (departments)
- 122 chairs (subdepartments)
- 6 research institutes
- over 1500 professors
- over 1000 PhD students
- over 39000 students

Nobel Prize winner (2004) professor **Ginzburg** worked at UNN (Radiophysics Faculty) for more than 20 years



UNN: General Overview...

Faculty of Computational Mathematics & Cybernetics

- *One of largest faculties* at the University of Nizhni Novgorod
 - over **1500** full-time (day-time) students,
 - over **240** students studying in the evening
 - **120** extramural students.
 - over **40** post-graduate students
- Teaching staff includes
 - **30 Professors**, Doctors of Sciences in Physics and Mathematics or Engineering
 - **54 Associate Professors**, Candidates of Sciences (Ph.D.) in Physics and Mathematics or Engineering
 - **4 professors** hold the honorary title of Merited Scientist of the Russian Federation

The Faculty of Computational Mathematics and Cybernetics was founded in 1963 at the University of Nizhni Novgorod as **the first such faculty in the USSR**



UNN: General Overview

More:

[Faculty of Computational Mathematics and Cybernetics](#)

[Software Department](#)

[Information Technologies Laboratory \(ITLab\)](#)

[Microsoft Innovation Center](#)

Problems of IT Education

Problems:

- Relative novelty and onrush development,
- Diversity of the qualifying requirements to specialists,
- High costs necessary to provide adequate equipment basis for training,
- Difficulties of organizing high quality professional practice,...

are well-known. It should also be noted that one of the most acute problems is maintaining the proficiency level of the teaching staff.

"All Problems" Solution

A possible way of solving the above mentioned problems is to arrange mutually beneficial collaboration among universities and IT companies.

Universities need this interaction with IT companies:

- to define the professional requirements to modern IT specialists,
- to get some consulting for planning the curriculum,
- to organize student professional practice etc.

IT companies understand that without any influence on the training process in universities and without reasonable financial support it would be difficult to solve the staff hiring problems and to attract new highly qualified specialists

Research Labs as a Form of Collaboration...

The efficient and time-approved way to organize mutually profitable collaboration among universities and IT companies is to set university **research laboratories**, which are supported by IT companies.

Creating these laboratories may be caused by purely pragmatic motives of having additional target training (within the interests of a concrete company) for students and solving recruiting problems and attracting graduates of the corresponding universities to the company.

However, apart from solving the issues of collaboration with particular companies, *these laboratories can significantly contribute to solving general strategic problems of IT education.*

Research Labs as a Form of Collaboration...

The following can be mentioned among the possible “extended” forms of **lab activities**:

- Organizing activities on the development of forms, methods and directions of IT specialists training; within this sphere labs can work on developing new educational systems, educational materials and software for the training curriculum etc.;
- Performing both general educational and industrial projects; the significance of this kind of activities is extremely high as the participation of students in these projects will lead to a higher proficiency level; work in projects contributes to the professional growth of the teaching staff as well; project implementation leads to improving the financial situation in universities;

Research Labs as a Form of Collaboration

- Cooperation among the laboratories focused on similar spheres in different universities for the purpose of experience exchange and, first and foremost, for mutual usage of the accumulated training and methodological materials for IT specialists training.

In general, it seems that educational research laboratories created in universities with the support from IT companies will be able to accumulate the best teaching staff and their cooperative work would lead to forming modern educational training programs of preparing highly qualified IT specialists

Example 1: UNN collaboration with Intel...



1999 - Intel provides to UNN **Eastern Europe's first** computer classroom on the basis of Intel® Pentium® III processors



2001 – Intel Corporation equips UNN with **the most powerful high-performance computing cluster in Russian universities**



2005 - Intel provides to UNN **Europe's first** computer classroom on the basis of dual-core Intel® Pentium® D processors

Example 1: UNN collaboration with Intel...

In 2003, Research and Educational Laboratory «Information Technologies» was set up in UNN with the support of Intel

Laboratory's Objectives

- Providing additional education in advanced areas of computer technologies
- Curriculum development, development of new study courses
- Expanding basic and applied research in the field of IT



Example 1: UNN collaboration with Intel...

ITLab is an innovative form of collaboration between Universities and IT companies:

- **no full-time staff**
 - everyone who has ideas for teaching and research can be in ITLab
- **all activities beyond the UNN curriculum and no official assigned students**
 - each UNN student can be in ITLab (overcoming the boundaries of departments)
 - strong competition for entering in ITLab (3-4 candidates for a position)
- **adaptability in education and research and project based approach**
 - lecturing best courses by high-qualified teachers
 - research in new perspective areas of IT

ITLab is a centre of attraction for highly qualified tutors and talented students

Example 1: UNN collaboration with Intel...

On the initiative of Intel, an innovative project entitled *Virtuoso* was held with the support of Microsoft, IBM, Borland and Kaspersky Laboratory



Project goal

To develop the skills of university teaching staff members from Russia and CIS countries involved in the training of experts in the field of IT



Example 1: UNN collaboration with Intel...

- Winter schools in parallel programming
 - 2004 – 43 persons (10 cities),
 - 2005 – 25 persons (7 cities),
 - 2006 – 22 persons (12 cities),
 - 2007 – 21 persons (10 cities)

In 2007, School participants were teaching staff members of Russian universities



between Universities
T companies

15 → 22

Example 1: UNN collaboration with Intel



The Diploma presented by Intel to the University of Nizhni Novgorod in recognition of its contribution in the training of top qualification experts in information technologies

Example 2: UNN collaboration with Microsoft...

- Subscription to MSDN AA for licensed use of Microsoft software
- Holding Research and Practical Conference «Microsoft Technologies in the Theory and Practice of Programming» (2006-2007)
- Support to Microsoft IT Academy's activities at UNN
- Holding regional round of International Technology Competition «Imagine Cup»



Example 2: UNN collaboration with Microsoft...

- In September 2006, Russia's first Competence Center in the field of high-performance computing on the basis of Microsoft technologies was opened
- In December 2006, Microsoft Innovations Center was opened



Microsoft HPC Theater Schedule

Wednesday, November 15th

10:20	Cisco
10:40	N.I. Lobachevsky State Univ. of Nizhni Novgorod
11:00	IBM
11:20	Mecalog
11:40	Microsoft Windows Compute Cluster Server 2003
12:00	NCSA
12:20	Florida Water Management
12:40	Microsoft Windows Compute Cluster Server 2003
1:40	University of Utah: School of Computing
2:00	Microsoft
2:20	Microsoft
2:40	NEC
3:00	Altair
3:20	Fluent
3:40	Tyan
4:00	Schlumberger
4:20	Wolfram
4:40	Dell
5:00	Verari
5:20	HP
5:40	Microsoft

Microsoft Windows Compute Cluster Server 2003

between Universities
and companies

Example 2: UNN collaboration with Microsoft



The screenshot shows the Microsoft PressPass website. At the top, there is a blue header with the Microsoft logo on the left and a search bar on the right. Below the header is a navigation bar with links for PressPass Home, PR Contacts, Fast Facts About Microsoft, Site Map, Advanced Search, and RSS Feeds. The main content area features a sidebar on the left with a 'Microsoft News' section containing links for Product News, Consumer News, International Contacts, Legal News, and Security & Privacy News. The main article is titled 'Bill Gates Shares Microsoft's Vision for Technical Computing' and includes a sub-section 'Partnering With and Investing in the HPC Community'. The article text describes a keynote address at Supercomputing 2005 and an investment in 10 institutes for high-performance computing worldwide, listing several universities as partners.

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- Consumer News
- International Contacts
- Legal News
- Security & Privacy News

Bill Gates Shares Microsoft's Vision for Technical Computing

Keynote address at Supercomputing 2005 announces public beta of Windows Compute Cluster Server 2003 and investments in 10 academic institutes.

Partnering With and Investing in the HPC Community

Gates also announced an investment in 10 Institutes for High-Performance Computing worldwide. This multiyear, multimillion-dollar investment in joint research projects at these institutes will help guide ongoing software research and product innovation at Microsoft to address the most challenging technical computing problems. These institutes are Cornell University (U.S.); Nizhni Novgorod State University (Russia); Shanghai Jiao Tong University (China); Tokyo Institute of Technology (Japan); University of Southampton (England); University of Stuttgart (Germany); University of Tennessee (U.S.); University of Texas at Austin (U.S.); University of Utah (U.S.); and University of Virginia (U.S.).

Bill Gates has included the University of Nizhni Novgorod in the number of 10 institutes that are Microsoft's equal partners in the field of high-performance computing

Conclusion

Globally, the **Mission of the Laboratories** founded with the support from IT companies may be regarded as consolidation of the major scientific, pedagogical and technical employees for the purposes of:

- improving and developing educational programs,
- organizing collaboration in this sphere among the leading universities and
- providing efficient cooperation universities with IT companies that create and effectively use the advanced computer technologies.

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