

Innovative Forms of Collaboration between Universities and IT Companies

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The paper deals with a number of issues connected with IT specialist training and the ways the issues can be solved by using the training and research laboratories supported by IT companies.

1. The problems of training highly qualified specialists are widely known but they are even more acute in the sphere of IT education. Among the problems we can mention, for instance, relative novelty and onrush development of this knowledge area, diversity of the qualifying requirements to specialists and high costs necessary to provide adequate equipment basis for training, difficulties of organizing high quality professional practice for students and many others. Maintaining the proficiency level of the teaching staff is among the most acute problems. The reasons for this are also quite clear: the constant pursue for the innovation in the IT sphere appears to be difficult for the older generation of teachers (that often make the bigger part of the university staff) while tragically low labor compensation in universities turns out to be an almost impassible barrier in attraction of younger specialists to teaching.

2. A possible, and probably most doable at the current moment, 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 organize the training of highly qualified specialists and to define the professional requirements to modern IT specialists, as well as to get some consulting for planning the curriculum that would correspond to the requirements of the modern IT industry and to organize student professional practice etc. On the other hand, IT companies need to understand that without any influence on the training process in universities and without reasonable financial support it would be difficult to solve the labor force problems and to attract new highly qualified specialists (experience shows that raising the proficiency level of employees in a particular company is very time-consuming and not efficient enough).

3. The efficient and time-tested way to organize this kind of 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 specialists training. The following can be mentioned among the possible “extended” forms of laboratory activities:

- Organizing activities on the development of forms, methods and directions of IT specialists training; Computing Curricula 2001 of international organizations IEEE-CS and ACM can be the methodological basis for these kind of activities; within this sphere laboratories can work on developing new educational systems, educational materials and software for the training curriculum etc.;

- Performing both general educational and manufacturing 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;

- 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 specialist 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.

4. The statements given in this report are confirmed by the example of IT Laboratory (see <http://www.itlab.unn.ru>), which was created in Nizhny Novgorod University in 2003 under the support from Intel.

The laboratory was founded for solving the complex problem of forming a stable training system to prepare highly qualified specialists in the sphere of modern computer technologies (taking into account the recommendations of Computing Curricula 2001 of IEEE-CS and ACM) for the companies and organizations working in the IT sphere.

The purposes of the Laboratory were the following ones:

- Analysis of the principles in training computer technologies specialists, both in Russia and abroad (recommendations of Computing Curricula 2001 of IEEE-CS and ACM, standards of Ministry of Education of the Russian Federation for specialists training, curricula of the leading universities of the country) and creation of the system of recommendations for improving the curricula and programs of specialists training on the basis of the analysis;
- Forming the programs and developing new educational systems in modern spheres of mathematical modeling, computational mathematics and industrial engineering of complex software;
- Organizing various additional educational programs on the basis of the new educational systems, courses and laboratory practical courses, which are developed in NNSU and in other leading universities and IT companies, and involving the leading technical and scientific specialists who are recognized in Russia and abroad;
- Organizing seminars, conferences, competitions for educational and scientific projects focused on the spheres of the carried out scientific research involving specialists from Russia and abroad;
- Organizing financial support in the form of individual scholarships and grants for students making great progress and engaged in research work, for masters, post-graduates and young scientists;
- Carrying out research works (by students and post-graduates) within the scientific interests of IT Companies.

Globally, the mission of the Laboratory may be regarded as consolidation of the major scientific, pedagogical and technical employees of Nizhny Novgorod University carrying out scientific research and training computer technologies specialists for the purposes of improving and developing educational programs of personnel training, organizing collaboration in this sphere among the leading universities of the country and providing efficient cooperation of the Nizhny Novgorod University with IT companies that create and effectively use the advanced computer technologies.