ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫЕ ТЕХНОЛОГИИ В НАУКЕ, ПРОИЗВОДСТВЕ И ОБРАЗОВАНИИ

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Сборник сформирован на основе материалов Международной научной конференции ICIT 2014 «Информационно-коммуникационные технологии в науке, производстве и образовании», проведенной Международным факультетом прикладных информационных технологий Саратовского государственного технического университета имени Гагарина Ю.А. 27-29 января 2014 года. В статьях приведены результаты исследований, посвящённых актуальным проблемам моделирования и управления сложными техническими и социально-экономическими системами.

В первом разделе собраны новые модели систем управления и методы их проектирования, вопросы совершенствования алгоритмов поиска наиболее рациональных, с точки зрения выбранных критериев, режимов их функционирования. Второй раздел посвящён вопросам, касающимся методам разработки информационных систем. В третьем и четвертом разделах собраны статьи, касающиеся практической разработки и особенностям функционирования сложных информационных систем управления различными социально-экономическими и техническими системами.

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FORMATION OF ITT - COMPETENCE OF SCIENTIFIC INDUSTRIAL STAFF

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Nowadays competence of scientific and industrial personnel is one of the main factors infiuencing the development of organizations, regions, cities and society as a whole.

Integration of education, science and production is one of the major goals of education development of Kazakhstan till 2015. President of the Republic of Kazakhstan Nursultan Nazarbayev said in his address to the nation on January 28th 2011, directed the Government to develop a roadmap for universities to invoke innovative activlties and create the National Council for the training technical personnel with the participation of representatives of business associations and employers.[1] Integration of education, science and industry is becoming a critical factor in the development and growth of the national economy's competitiveness.

The most vivid examples of cooperation between business and science are technoparks, which enclose major integration processes of science, education and industry. Technopark is the basis of a venture business, it promotes continuous formation of a new business and subsequent support.

Technopark pays great attention to the preparation of research staff and as well as proper selection of specialties that reflect all possible requirements of scientific and industrial activity.

Kazakhstan Qualification handbook for managers, professionals and other employees (amended on 17.04.2013) does not reflect all the queries of the ITT (Information and Telecommunication Technologies) sector.

Education in ITT should be aimed to expectations of industry, however, our learning model has little changed. As compared specialties classifier, curricula and training programs in Kazakhstan with similar documents of European countries, the U.S., India and China shows that education in Kazakhstan does not correspond to the world standards.

Information and Telecommunication Technologies is a new management technology that affects all aspects of scientific and industrial activities of techno parks. Competence development of scientific and industrial staff is one of the conditions for its implementation. A major factor adversely affecting the implementation of ITT, is the lack of computer literacy and competence of experts.

The use of computer hardware and software for multimedia research is very important, so with the help of ITT tools, scientists can demonstrate all kinds of physical, chemical and mathematical processes.

Traditional tools and capabilities	Perfection through the use of software and hardware ICT
The spoken word, the written word (textbooks and manuals, books).	Transmission of textual information from the screen. The possibility of multiple repetition of the same content. Quick search for information using a system of hyperlinks.
Objects, models, models, collections, tables, posters, charts, illustrations, videos. Static demonstration screen. Observation of fixed objects.	Multimedia presentation techniques and operations; virtual transformation of objects in space and on the plane; visualization processes, impossible to consider in real conditions.

Information and Telecommunication competence of scientific and industrial staff is a competence related to the field of Information and Telecommunication Technologies, which are the main components of individual abilities and qualities that define its capabilities and skills:
- to search for , analyze , present and communicate information ;
- to model and design objects and processes , including - their own individual action and collective activity ;
- creatively and effectively solve problems that arise in front of him or her in the process of scientific activity;
- to be able to orientate oneself in environment, organizational based on modern information and communication technologies;
- competently use in their professional work modern means of information and communication technologies, providing a multiple increase productivity.

Within the existing educational programs of universities and colleges, students receive a large amount of information that is unlikely to ever be useful to them. But, unfortunately, lose large amount of necessary knowledge and skills such as creating software, project management, risk management, requirements management, configuration management for software development, software quality issues, human-computer interaction and management of software development teams.

Nowdays, enterprises are forced to retrain graduates of Kazakhstan universities and colleges recruited by spending both financial and time

resources. In this case it leads to an increase in the cost of domestic goods and services in ITT industry, and consequently the competitiveness is reduce. The problem is the lack of flexible feedbacks between the demands of the labor market and vocational training system. Inconsistency of ITT specialties in Universities of Kazakhstan with the European ITT profile also affects the development of the regions.

To resolve the given contradictions it is essential to establish close relationship between ITT industry and higher education. In reality this can only happen in a natural way and on mutually beneficial conditions. To experience such a mutual beneficial, it is necessary to integrate the local scientific and educational resources into a single research and educational resource. One of the modern ways to integrate is the cluster approach. This term refers to the uhion of related business entities into a single orgahizational structure, the elements of which are interrelated and interdependent so they co-operate to achieve the defined goals . Adequate response of the Higher School of ITT on the rapid development of the ICT industry is the creation of regional clusters of ITT. This cluster is understood as a union of regional uhiversities offering training in ITT. The purpose of the regional ITT cluster is improving the quality of higher education in ITT, creating a system of training a new generation of ITT professionals in higher education and development of close relationships between uhiversities and ITT industry. This cluster should consist of uhiversities, ITT compahies, which are interested in training of their staff, government and infrastructural organizations.

Strengthehing the links between education and business in ITT and competence formation of scientific and operational skills will enhance research and innovation activities of the technopark in KazNU.

Technopark KazNU faced the same problems as many employers:
- The names of the structures and content of job descriptions / professions / roles are not uniquely defined;
- high dynamic of profession updates;
- low maturity of the implementation of standards of personnel management;
- HR management (recruitment, development, evaluation ...) is hampered;
- The orgahizational form of professional communities are not developed enough;
- low productivity.

It is not a secret that the majority of ITT staff came to this area from other related (in some cases not related) areas. And everything they know is obtained on the short-term training , or by self-education (was conceived by their own experience). Until now this situation suited for employers. Today, compahies are looking for other IT personnel. Firstly, compahies need people who is able not only cope with everyday problems, but also to prevent the emergence of new

emergency situations. Secondly, employers want the specialist to have good basic education directly in the field of ITT. Thirdly, employers prefer certified professionals.

KazNU Science and Technology Park needs the following specialists:
• Database administrator
• Network administrator
• Engineer - programmer
• IT-project manager
• System administrator

Finally, we can conclude that ITT competence of science and industry staff (as a part of research activities) is the determining factor of the future implementation of innovative projects and allows to significantly improve the efficiency of the research process.

References
1. Speech of the President of the Republic of Kazakhstan Nursultan Nazarbayev, 28th of January "We build the future together".
2. Official site of JSC "National Innovation Fund»: http://www.nif.kz;
3. State Education Development Programme of the Republic of Kazakhstan for 2011-2020;
4. Official site of Kazakh National University. Al-Farabi: www.kaznu.kz;

СОДЕРЖАНИЕ