MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL ACADEMY OF EDUCATIONAL SCIENCES OF UKRAINE
INSTITUTE OF HIGHER EDUCATION

STATE UNIVERSITY «UZHHOROD NATIONAL UNIVERSITY»
EDUCATIONAL AND RESEARCH INSTITUTE OF EUROPEAN INTEGRATION STUDIES

A series of "European Integration: Ukrainian Dimension"
Issue 27

INNOVATIONS IN HIGHER EDUCATION: DOMESTIC AND FOREIGN EXPERIENCE

Study manual

Under the General Editorship of
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Uzhhorod
2016

ББК 74.58я7
УДК 378(075)
І-66

The publication is issued with the financial support of the International Visegrad Fund

Recommended for publication by the Academic Council of the SU «Uzhhorod National University» (Protocol No. 12 of 27.11.2015)

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І-66 Innovations in higher education: domestic and foreign experience: Study manual /I. Artjomov, I. Studenyak, J. Golovach, A. Gus. – Uzhhorod: SU "Uzhhorod National University", 2016. – 348 p. (*A series of "European Integration: Ukrainian Dimension". Issue 27*).

ISBN 978-617-7333-07-3

In the study manual"Innovations in higher education: domestic and foreign experience" disclosed conceptual aspects in formation of a single European educational area, specific features of the Visegrad Four innovative policies, implementing educational innovations in higher education institutions of the world and Ukraine.

The manual is part of educational and methodical complex developed by ER Institute of European Integration Studies in the framework of the research project "Innovative university – tool of integration to European educational and research area".

The publication is dedicated to the 70th anniversary of the SU "Uzhhorod National University"

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ISBN 978-617-7333-07-3

CONTENTS

PREAMBLE

Recognition of European integration as Ukraine's strategic foreign policy priority, signing the Ukraine-EU Association Agreement, adoption of new Law of Ukraine "On Higher Education", introduction of the concept for development of higher education for the period 2015-2025 set new actual challenges for high school on its way to European and global educational area to ensure high-tech provision and innovation development of our country and meetdemands of society as well as labor market requirement for qualified specialists.

The main problem of nowadays is training specialists of new quality, able to think creatively, orientin modern information space quickly, make unconventional decisions, learn and develop throughout life, and the most crucial is to be a patriot of Motherland.

Law of Ukraine "On Higher Education" notes ***innovation part*** as key component of higher education. In particular, articles 65,66,67,68 define legal forms of innovations introduction, change financial autonomy of universities. Implementation of the law will promote the integration of Ukraine into a single educational area, which is essential to raise the issue of Ukrainian diplomas recognition in the world, and further education of students in foreign universities.

Major task of research and ***innovation activity*** of the university is gaining knowledge through research and development and their focus on the creation and implementation of new competitive technologies, provision of innovative development of society and training specialists of innovative type.

It was started the implementation of the research project ***"Innovative University – tool of integration to European ed-***

ucational and research area" with the financial support of the International Visegrad Fund.

The project aim is to develop the concept of innovative university formation of the European type at "Uzhhorod National University", based on European experience analysis, especially the V4 countries, international experience of higher education innovative activity, through co-work with manufacturing companies of the region and scientific institutions of the Visegrad Group.

This concept will help to create regional innovation structure **Science Park "Uzhhorod National University"**inTranscarpathian region through cross-border cooperation. Its task to ensure sustainable socio-economic development of the region through implementation of scientific, technical and innovation activities of research institutions, effective use of the existing scientific potential and broad attraction of domestic and foreign inventions and technologies, regional industrial, energy, material, technological, technical and human resources.

UzhNU partners in this project are:

Rzeszow University (Rzeszow, **Poland**), University of Debrecen (Debrecen, **Hungary**), Technical University in Kosice (**Slovak Republic**), NGO "Institute of transborder cooperation" (Uzhgorod, **Ukraine**).

Project target groups are:

- border area mass media;
- university students of Slovak Republic, Hungary, Poland, Romania and Ukraine border regions;
- NGOs that operate in the field of cross-border cooperation and tourism, environmental protection, economic and social development;
- legal entities and individuals, whose professional activity is related to the problems of development, implementation and use of certain production samples of innovative products;
- scientific and research institutions of Visegrad countries interested in intensification of cooperation in the sphere of innovations;

- representatives of deputies of regional and district councils, employees of state administrations and executive bodies of local governments, whose professional activity related to the problems of sustainable socio-economic development of the region.

The result of the research project ***"Innovative University – tool of integration to European educational and research area"*** is preparation of the Concept of innovative development for UzhNU.

Significant organizational and analytical work was performed during the project. In particular, "round table" on **"Implementation of the Law of Ukraine "On Higher Education" – a necessary premise of integration in the European Higher Education and Scientific Research"** took place on 23rd of April with participation of law developers and national experts **Luhovyi V.I.**, First Vice President of NAS of Ukraine; **Rashkevych Y.M.**, Rector for Scientific and Pedagogical Work and International Relations "Lviv Polytechnic", **Talanova Zh.V.**, Head of the Ukrainian branch of the program "Erasmus +" - Ukraine, members of the international group of experts **Sherehiy Eugen**, Director of the Research Center of microelectronics and nanotechnology of Rzeszow University (Poland), **Kokenyeshi Alexander**, Professor of Debrecen University (Hungary), **Lisi Vladimir**, Professor of Technical University (Slovakia) and **Yanka Burianova**, Consul General of Slovakia in Uzhhorod; **Lenka Buchkova** and **Katarina Hubova**, coordinators ofVisegrad Fund and others.

Considering significant amount of analytical work in the implementation process of the project on monitoring programs and innovative development concepts of European universities and the Visegrad countries in particular and leading universities of America and Asia therewere created expert working groups on various components of the universities innovation development:

- **Analysis and synthesis of best innovation activity ofresearch universities in Ukraine: condition, main directions and priorities.**

- **Generalization of experience of innovative universities in Europe, America and Asia.**
  - **Generalization of experience of Visegrad Group countries on innovation development of universities and mechanism of its implementation in UzhNU.**
  - **Legal base of universities functioning and practice of implementing innovative forms and methods of their operation in Poland, Hungary and the Slovak Republic.**
- Development of mechanism for effective cooperation between science and industry as part of cross-border cooperation with the Visegrad Group countries.
- Implementation of educational innovation under Law of Ukraine "On Higher Education" as necessary prerequisite for integration into the European educational and scientific area.
- «Science park UzhNU» is an effective mechanism for implementation of the results of innovative research: stages of formation and development prospects.
- Challenges to the creation of innovative University: forms and mechanisms to solve them.

The project realization involves experience of neighbouring European countries universities, border conditions, effective cooperation in the framework of international educational programs that will promote integration of Ukrainian higher education into European educational and scientific area.

As part of the research project "Innovative University – tool of integration to European educational and research area"International Scientific and Practical Conference ***"Education Mobility, Innovation Culture and Social Responsibility as the Resources of Competitiveness of European Universities"***was held in April 2015*.*

Along with representatives of Transcarpathian Hungarian Institute named afterFerenzRakoczy II,Mukachevo State University, Carpathian University named after Augustin Voloshin, Vasyl-

Stefanyk Precarpathian National University, Ukrainian Catholic University, Zhytomyr State University named after Ivan Franko, delegations from other European countries and Kazakhstan attended the conference, namely:

- **University of Debrecen (Hungary)** led by the Vice-Rector AndrashJawor;
- **University of Economics in Bratislava (Slovak Republic)** led by the Dean of the International Relations Faculty Lyudmila Lipkova;
- **Pomeranian Academy in Slupsk and University of Rzeszow (Poland),** led by the rector of the Academy Roman Drozd and the director of microelectronics and nanotechnology center Eugen Sherehiy;
- **VasileGoldis Western University and Babes-Bolyai University (Romania)** led by the Vice-Rector HavryloArdelyan and President of the Babes-Bolyai University Senate IoanChirila;
- **Darmstadt University of Applied Sciences (Germany)** headed by the Professor Klaus Hebermehl;
- **M. Romeris University (Lithuania)** led by the Professor AlvidasBalezhentis;
- **Gumilyov Eurasian National University in Astana (Kazakhstan),** led by the Vice-Rector AbzalTaltenov and the director of the Ukrainian Center for Science and Culture Petro Tokar.

Conference participants discussed in detail and comprehensively mobility problems of education, innovation culture and social responsibility, that significantly affect the competitiveness of European universities. Experience of last one is especially important for Ukrainian universities.

The result of two-day work of the international scientific conference is the signing of **Memorandum on the Establishment of the International Consortium of Universities** by rector of Uzhhorod National University and heads of foreign delegations.

It should be noted that the development of Uzhhorod National University during following years depends on the future research and education, social and community self-fullfilment of its employees and students. To do this we need to:

- **maximize the use** of border conditions for starting projects with European partners in the international educational programs, that will facilitate the integration of Ukraine into the European Union;
- **consistently implement** innovations and information technology into educational process of mastering ***foreign languages*** by teaching staff;
- **attract** UzhNU scientists and students to participate in European Framework Programme "Horizon", which will increase their mobility in terms of international cooperation;
- **raise** mechanisms to support applied research and development of innovative technologies in form of European practice ie innovative laboratories, platforms, science parks, networks etc as part of UzhNU development strategy;
- **develop** international cooperation with universities in the European Union, which will allow to become a full member of scientific solutions in system of Higher Education internationalization, which provides:
  a) **modernization** of curricula, introduction of modern educational technologies according to international best practices and creation of international university networks and promotion of their own educational services at international market**;**
  b) **involvement** of universities to universally recognized international certification system, participation in double diplomas programs;
  c) **operation** of exchange programs, students` mobility, participation in international educational and scientific projects, ensuring proper level of training of foreign students.

Implementation of these and other components of the Law of Ukraine "On Higher Education", in our opinion, will be an important stage of UzhNU specific work on the implementation of its provisions in the process of integration of scientific and educational area of the European Union.

When developing the Concept and Strategy of innovative university at UzhNU, one should undoubtedly consider the experience of leading national universities, which define innovation a starting point of their activity.

The work of the expert groups that studied the experience of leading universities of foreign countries in the context of their innovative development, gives reason to believe that it can be successfully implemented in Uzhhorod National University.

The proposed publicationanalyses and summarizes basic legal documents for the formation of a single European educational and scientific area.

Structure of the manual:

The first part *"Conceptual aspects in formation of a single European educational area"* is dedicated to the analysis of regulations that became the basis of European educational area.

The second part "*Features of innovation policy in the Visegrad Group countries in higher education sphere*" examines the basic provisions of V4 countries innovation policy, which are important in the context of the European educational area. Much attention is paid to the institutional and legal support of innovative activity in educational and scientific area of Hungary, the Czech Republic, Slovakia and Poland.

The third part "*Innovations in education and science of the certain countries of Europe, Asia and America***"** characterized innovative aspects of high school in certain foreign countries, analyzed general principles of innovative development.

The fourth part "*Innovative activity in higher education institutions of Ukraine"* contains analysis of the institutional and legal support and formation of principles for internationalization of higher education taking into account the European integration of Ukraine. A special place is given to the provisions of the Association Agreement with the European Union, Law of Ukraine "On Higher Education" and other legal acts.

The fifth part "*Infrastructure provision of innovative activity for higher education institutions*" devoted to the analysis of experience of similar bodies in the leading universities of Ukraine and the Visegrad Group. Particular attention is paid to structuring innovative projects of Uzhhorod National University and the development of mechanisms for their implementation.

The manual will undoubtedly be useful for students studying discipline "Higher Education in Ukraine and the Bologna Process".

We hope that this publication will also be useful for the organizers and academics of higher education during implementation of the basic provisions of the Law of Ukraine "On Higher Education".

Ivan Artjomov,
Head of writing team,
Candidate of Historical Sciences, Associate Professor,
Director of the ERI of European Integration Studies of UzhNU

Part 1

CONCEPTUAL ASPECTS IN FORMATION OF A SINGLE EUROPEAN EDUCATIONAL AREA

Global integration processes of the modern world are an objective trend of development in all spheres of public life. The comprehensive nature of these processes requires making management criteria in the new stage of social development. Because the processes of globalization affected not only social production, but also cultural and spiritual life, educational and scientific spheres, having become determining factors of formation a method and quality of life around the world and some state-organized societies.

That is why a great requirement of time is in training a new generation of professionals, able to think creatively, quickly orientate in today's saturated media space, make unconventional decisions, learn and develop throughout life. At the beginning of the XXI century a demands on the quality of education and training of specialist increased significantly. Today we need education, updating constantlyknowledge, technology, learning tools, organizational and management approaches. Such education is innovative, so, its essence can be conveyed in words, "Do not catch up with the past and create the future".

It is known, that the concept of quality in higher education synthesizes partial concepts, developed within the Bologna process and systematically united with one goal. Fundamentals of the Bologna process in Europe, laid down after the Second World War, by the adoption of the European Convention on the Equivalence of Diplomas (**1953**) and the Protocol thereto (**1964**), the European Cultural Convention (**1954**), Convention on the recognition of studies, diplomas and degrees in countries of the European Region (**1979**), the European Convention on the general equivalence of periods of university study (**1990**) and the Convention on the Recognition of Qualifications concerning higher Education in the European Region.

The European Cultural Convention is an international treaty opened for signature by the Council of Europe in Paris on 19 December 1954 and became the basis for development of the Bologna process. The convention has been ratified by all 47 member states of the Council of Europe. The member of the Council of Europe at that time agreed upon this Convention which included references to states acting and implementing measures for its national contribution to the shared cultural heritage. It also discussed the importance of nationals studying other languages, history and civilizations; the creation of cultural activities on a European level and the facilitation of movement and exchange of people and cultural objects. The Convention promotes cooperation among European nations in order safeguard cultural property as well as to study and promote European civilization. The cultural property of the parties to the Convention is regarded as part of the common cultural heritage of Europe. The Convention emphasizes the nation as protector of the heritage not only for its own people but also for the wider community. Its signature is one of the conditions for becoming a participating state in the Bologna Process and its European Higher Education Area (EHEA).

Upon this, the parties agreed to the extent possible, take measures and make efforts to:

– "take appropriate measures to safeguard and to encourage the development of its national contribution to the common cultural heritage of Europe" (Art.1);

– encourage the study by its own nationals of the languages, history and civilisation of the other Contracting Parties and grant facilities to those Parties to promote such studies in its territory (P.a. Art.2);

– endeavour to promote the study of its language or languages, history and civilisation in the territory of the other Contracting Parties and grant facilities to the nationals of those Parties to pursue such studies in its territory (P.b Art.2).

In the framework of the Council of Europe they have pledged to carry on mutual consultations in order to implement joint actions that promote cultural activities of mutual interest, facilitate the movement of persons and objects that have cultural value and sharing.

Ideas of this cultural association of European countries and universities in particular have been developed in the **Great Charter of Universities** (Magna Charta Universitatum). The proposal to its adoption was initiated by the University of Bologna which in 1986 sent its oldest universities in Europe and they accepted it positively.

This was facilitated by the fact that the Charter program ideas developed by universities without political power and institutions based on the fundamental values of the European university traditions. Strengthening the relations between higher education institutions contributed additions to the process of non-European universities.

For development of the draft Charter, at a meeting in Bologna **(June 1987)** delegates of 80 European universities have created a council of eight members – heads of leading European universities and representatives of the Council of Europe. Development of the draft was completed in January 1988 in Lisbon. On this basis, in May 25, 1998 the Ministers of Higher Education of UK, Germany, France and Italy adopted in Paris a Sorbonne Joint Declaration.

1.1. Sorbonne Declaration (May 1998)

In 1998, two years before the EU's Lisbon Council and on the occasion of the 800th anniversary of the Sorbonne University, the education ministers from France, Germany, Italy, and the United Kingdom met in Paris. During that meeting, they signed the three-page Sorbonne Declaration on ***Joint declaration on harmonisation of the architecture of the European higher education system***[12]in which they agreed to commit themselves "to encouraging a common frame of reference, aimed at improving external recognition and facilitating student mobility as well as employability." They also called upon other European countries to join them in their objective and all European universities to "consolidate Europe's standing in the world through continuously improved and updated education for its citizens." It noted that Europe is "not only that of the Euro, of the banks and the economy: it must be a Europe of knowledge as well." The Sorbonne Declaration's narrative referred to several developments, which, if continued, would help achieve the stated objectives. These developments included:

– developing a twocycle system, with undergraduate and graduate degrees;
– using a standardized credit system, such as the ECTS scheme, and semesters;
– having a diversity of programs, including opportunities for multidisciplinary studies, development of a proficiency in languages, and the ability to use new information technologies; and
– encouraging students to spend at least one semester in universities outside their own country and encouraging teaching and research staff to work in European countries other than their own.

The Sorbonne Declaration also summarized the progress that had been made to date on the mutual recognition of higher education degrees for professional purposes and cited as an example the Lisbon Convention that UNESCO and the Council of Europe adopted. The Sorbonne Declaration concluded by calling upon both EU Member States and other European Countries to join the Sorbonne Declaration signers in their education initiative.

In contrast to the later Bologna Process documents, the Sorbonne Declaration is rather general and vague. But it is an important document because it initiated the Bologna Process.

1.2. Bologna Convention (June 1999)

The second key document in the development of the Bologna Process is the Bologna Declaration.In 1999, one year after the Sorbonne meeting, ministers from twenty-nine countries, in contrast to the four initial countries in Sorbonne, met and signed the Bologna Declaration.It is interesting to note that this document wassigned one year before the EU adopted its Lisbon Strategy. Almost half of the Bologna Declaration's twenty-nine signatories (fourteen, to be exact) were not EU Member States.

The six-page Bologna Declaration was more specific and focused than the Sorbonne Declaration. In addition to reaffirming its support for the general principles in the Sorbonne Declaration, the Bologna Declaration identified six objectives that the participants wanted to achieve by 2010 in order "to establish the European area of higher education and to promote the European system of higher education world-wide."The six objectives set forth in the Bologna Declaration were:

1. Adoption of a system of easily readable and comparable degrees, also through the implementation of the Diploma Supplement, in order to promote European citizens employability and the international competitiveness of the European higher education system.

2. Adoption of a system essentially based on two main cycles, undergraduate and graduate. Access to the second cycle shall require successful completion of first cycle studies, lasting a minimum of three years. The degree awarded after the first cycle shall also be relevant to the European labour market as an appropriate level of qualification. The second cycle should lead to the master and/or doctorate degree as in many European countries.

3. Establishment of a system of credits—such as in the ECTS system—as a proper means of promoting the most widespread student mobility. Credits could also be acquired in non-higher education contexts, including lifelong learning, provided they are recognised by receiving Universities concerned.

4. Promotion of mobility by overcoming obstacles to the effective exercise of free movement with particular attention to:

- for students, access to study and training opportunities and to related services
- for teachers, researchers and administrative staff, recognition and valorisation of periods spent in a European context researching, teaching and training, without prejudicing their statutory rights.

5. Promotion of European co-operation in quality assurance with a view to developing comparable criteria and methodologies.

6. Promotion of the necessary European dimensions in higher education, particularly with regards to curricular development, interinstitutional co-operation, mobility schemes and integrated programmes of study, training and research.

Some of the objectives listed in the 1999 Bologna Declaration referred to ongoing higher education initiatives by the EU, the Council of Europe, and UNESCO. For example, the Bologna Declaration cited the EU's ECTS system as an example of a credit system that could be adopted.The Bologna Declaration also called on participants to use the Diploma Supplement, which had been incorporated by reference into the 1997 Lisbon Convention.

A flurry of activity followed the signing of the 1999 Bologna Declaration.This activity is documented in the 2001 Lourtie Report that was commissioned by the BFUG.The thirty-seven page Lourtie report provides details about the follow-up activities that occurred after the 1999 Bologna meeting.The appendices included the reports and conclusions from five conferences that had addressed the Bologna Process.Because the Bologna Process did not have a webpage at the time, the Lourtie Report is useful documentation of the official Bologna Process work that was undertaken between the 1999 Bologna Ministerial Meeting and the 2001 Prague meeting.

In addition to the official activity it documented, the Lourtie Report showed a number of stakeholder-sponsored activities. Both the EUA and the ESIB sponsored conferences to discuss the Bologna Process and European higher education.In 2001, EUA issued its Trends II report on the Bologna Process.ESIB also issued a report on the Bologna Process in 2001.The European Commission was named a member of the follow-up group and was actively involved in promoting the Bologna Declaration objectives. Among other things, the Commission prepared the "ECTS Extension Feasibility Project Report" in February of 2000 as well as a survey on lifelong learning.In sum, the Lourtie Report confirms that there were significant activities following the 1999 adoption of the Bologna Declaration [2].

1.3. Salamanca Conference (March 2001)

Over 300 European higher education institutions and their main representative organisations gathered **in Salamanca on 29-30 March 2001.** Their purpose was to prepare their input to the Prague meeting of the Ministers in charge of higher education in the countries involved in the Bologna Process; they have agreed on the following goals, principles and priorities [13]:

Shaping the future

European higher education institutions reaffirm their support to the principles of the Bologna Declaration and their commitment to the creation of the European Higher Education Area by the end of the decade. They see the establishing of the European University Association (EUA) in Salamanca to be of both symbolic and practical value in conveying their voice more effectively to governments and society and thus in supporting them shape their own future in the European Higher Education Area.

Principles

Autonomy with accountability

Progress requires that European universities be empowered to act in line with the guiding principle of autonomy with accountability. As autonomous and responsible legal, educational and social entities, they confirm their adhesion to the principles of the Magna Charta Universitatum of 1988 and, in particular, to that of academic freedom. Thus, universities must be able to shape their strategies, choose their priorities in teaching and research, allocate their resources, profile their curricula and set their criteria for the acceptance of professors and students. European higher education institutions accept the challenges of operating in a competitive environment at home, in Europe and in the world, but to do so they need the necessary managerial freedom, light and supportive regulatory frameworks and fair financing, or they will be placed at a disadvantage in cooperation and competition. The dynamics needed for the completion of the European Higher Education Area will remain unfulfilled or will result in unequal competition, if the current over-regulation and minute administrative and financial control of higher education in many countries is upheld. Competition serves quality in higher education, is not exclusive of cooperation and cannot be reduced to a commercial concept. Universities in some countries in Europe are not yet in a position to compete on equal terms and are in particular faced with unwanted brain drain within Europe.

Education as a public responsibility

The European Higher Education Area must be built on the European traditions of education as a public responsibility; of broad and open access to undergraduate as well as graduate studies; of education for personal development and lifelong learning; and of citizenship as well as of short and long-term social relevance.

Research-based higher education

As research is a driving force of higher education, the creation of the European Higher Education Area must go hand in hand with that of the European Research Area.

Organizing diversity

European higher education is characterized by its diversity in terms of languages, national systems, institutional types and profiles and curricular orientation. At the same time, its future depends on its ability to organize this valuable diversity effectively to produce positive outcomes rather than difficulties, and flexibility rather than opacity. Higher education institutions wish to build on convergence — in particular on common denominators shared across borders in a given subject area — and to deal with diversity as an asset, rather than as a reason for non-recognition or exclusion. They are committed to creating sufficient self-regulation in order to ensure the minimum level of cohesion so that their efforts towards compatibility are not undermined by too much variance in the definition and implementation of credits, main degree categories and quality criteria.

Key issues

Quality as a fundamental building stone

The European Higher Education Area needs to build on academic core values while meeting stakeholders' expectations, i.e., demonstrating quality. Indeed, quality assessment must take into consideration the goals and mission of institutions and programs. It requires a balance between innovation and tradition, academic excellence and social/economic relevance, the coherence of curricula and students' freedom of choice. It encompasses teaching and research as well as governance and administration, responsiveness to students' needs and the provision of non-educational services. Inherent quality does not suffice, it needs to be demonstrated and guaranteed in order to be acknowledged and trusted by students, partners and society at home, in Europe and in the world.

Quality is the basic underlying condition for trust, relevance, mobility, compatibility and attractiveness in the European Higher Education Area.

Trust building

As research evaluation has an international dimension so does quality assurance in higher education. In Europe, quality assurance should not be based on a single agency enforcing a common set of standards. The way into the future will be to design mechanisms at European level for the mutual acceptance of quality assurance outcomes, with "accreditation" as one possible option. Such mechanisms should respect national, linguistic and discipline differences and not overload universities.

Relevance

Relevance to the European labor market needs to be reflected in different ways in curricula, depending on whether the competencies acquired are for employment after the first or the second degree. Employability in a lifelong learning perspective is best served through the inherent value of quality education, the diversity of approaches and course profiles, the flexibility of programs with multiple entry and exit points and the development of transversal skills and competencies such as communication and languages, ability to mobilize knowledge, problem solving, team work and social processes.

Mobility

The free mobility of students, staff and graduates is an essential dimension of the European Higher Education Area. European universities want to foster more mobility — both of the "horizontal" and the "vertical" type — and do not see virtual mobility as a substitute for physical mobility. They are willing to use existing instruments for recognition and mobility (ECTS, Lisbon Convention, Diploma Supplement, NARIC/ENIC network) in a positive and flexible way. In view of the importance of teaching staff with European experience, universities wish to eliminate nationality requirements and other obstacles and disincentives for academic careers in Europe. However, a common European approach to virtual mobility and transnational education is also needed.

Compatible qualifications at the undergraduate and graduate levels

Higher education institutions endorse the move towards a compatible qualification framework based on a main articulation in undergraduate and postgraduate studies. There is broad agreement that first degrees should require 180 to 240 ECTS points but need to be diverse leading to employment or mainly preparing for further, postgraduate studies. Under certain circumstances a university may decide to establish an integrated curriculum leading directly to a Master-level degree. Subject-based networks have an important role to play in reaching such decisions. Universities are convinced of the benefits of a credit accumulation and transfer system based on ECTS and on their basic right to decide on the acceptability of credits obtained elsewhere.

Attractiveness

European higher education institutions want to be in a position to attract talent from all over the world. This requires action at institutional, national and European levels. Specific measures include the adaptation of curricula, degrees readable inside and outside Europe, credible quality assurance measures, programs taught in major world languages, adequate information and marketing, welcoming services for foreign students and scholars, and strategic networking. Success also depends on the speedy removal of prohibitive immigration and labor market regulations.

European higher education institutions recognize that their students need and demand qualifications which they can use effectively for the purpose of their studies and careers all over Europe. The institutions and their networks and organizations acknowledge their role and responsibility in this regard, and confirm their willingness to organize themselves accordingly within the framework of autonomy.

Higher education institutions call on governments, in their national and European contexts, to facilitate and encourage change and to provide a framework for coordination and guidance towards convergence. They affirm their capacity and willingness to initiate and support progress within a joint endeavor:

- to redefine higher education and research for the whole of Europe;
- to reform and rejuvenate curricula and higher education as a whole;
- to enhance and build on the research dimension in higher education;
- to adopt mutually acceptable mechanisms for the evaluation, assurance and certification of quality;
- to build on common denominators with a European dimension and ensure compatibility between diverse institutions, curricula and degrees;
- to promote the mobility of students and staff and the employability of graduates in Europe;
- to support the modernization efforts of universities in countries where the challenges of the European Higher Education Area are greatest;
- to meet the challenges of being readable, attractive and competitive at home, in Europe and in the world; and
- to continue to consider higher education as an essential public responsibility.

1.4. Prague Conference (May 2001)

In May 2001, two years after the 1999 signing of the Bologna Declaration, ministers from thirty-two European countries met in Prague "in order to review the progress achieved and to set directions and priorities for the coming years of the [Bologna] process." As a result of this meeting, they issued the three-page Prague Communiqué in which they "reaffirmed their commitment to the objective of establishing the European Higher Education Area by 2010." In addition to this general reaffirmation, the Prague Communiqué elaborated upon the six objectives that had been set forth in the Bologna Declaration. For each of these six objectives, the Prague Communiqué set forth a series of specific tasks that should be undertaken to help achieve that objective.

In addition to providing concrete suggestions about how to achieve the previously-identified six objectives, the Prague Communiqué identified three new objectives for the Bologna Process participants. ***These new objectives included:***

a) life-long learning,

b) involving universities and students as active partners in the Bologna Process, and

c) promoting the attractiveness of the EHEA.

The Prague Communiqué included information about membership in the Bologna Process and its criteria. It announced that the Bologna Process Ministers had accepted Cyprus, Croatia, and Turkey as participants and explained that applications would be accepted from countries that were eligible to participate in the EU's Socrates, Leonardo da Vinci, or Tempus-Cards programs.

The Prague Communiqué identified a number of steps that should be taken by way of follow-up, including a Ministerial Meeting to be held in 2003 in Berlin. It also instituted structural changes to the Bologna Process by establishing both a preparatory group and a follow-up group.

The Prague Communiqué identified the EUA, EURASHE, ESIB, and the Council of Europe as stakeholder groups that should be regularly consulted. It also identified several issues on which such consultation should be sought. ***The Prague Communiqué directed the BFUG to arrange seminars on the topics of***

1) accreditation and quality assurance,

2) recognition issues and the use of credits in the Bologna process,

3) the development of joint degrees,

4) the obstacles to mobility and other social dimensions, and

5) lifelong learning and student involvement.

After the 2001 Prague meeting, the BFUG was extremely active. Much of this activity is documented in the 2003 Zgaga Report, which the BFUG commissioned, just as it had done with the 2001 Lourtie Report. However, in addition to the Zgaga Report, the post-Prague work is documented on the Bologna Process website created by the German government. Although the position of the Bologna Process Secretariat had not yet been created, from the perspective of current researchers, the German government served as the equivalent of a Secretariat, and its 2001-2003 Berlin Bologna website was similar to the later Secretariat websites.

The Zgaga Report and the Berlin Bologna website identify a number of official Bologna Process events, as well as events sponsored by the consultative members. The official activities included the national reports prepared by the Bologna Process participants to demonstrate their Bologna implementation. Six official seminars addressed a wide range of issues. These seminars generated a number of papers and recommendations.

The Zgaga Report and the Berlin Bologna website also document extensive seminars by the Bologna Process consultative members that supplemented the official Bologna seminars. The EU was extremely active during this period, as is evident from an examination of the Berlin Bologna website, which lists the EU's activities, and a review of the EU's Report that analyzed the progress that had been made on EU initiatives relevant to the Bologna Process. The Council of Europe's activities are documented in a report it prepared and on the Berlin Bologna website.

University and student groups also were active in the period following the 2001 Prague meeting. The EUA prepared its third "Trends" report and also prepared a report on Joint Degrees. The student group ESIB prepared its first Bologna With Student Eyes report in 2003, in anticipation of the Berlin Ministerial Meeting. Other groups were also active during this period: the Berlin Bologna webpage includes links to twenty-four position papers. The Berlin Bologna website also includes a table that summarized the views in many of these position papers.

In addition to the seminars and reports mentioned above, a concerted effort ensued to educate Bologna Process members and others. The Berlin Bologna website included links to the higher education acts of selected countries, a glossary explaining the various acronyms and terms, a "news" page, and a links page. Thus, by the time the 2003 Berlin meeting occurred, significant preparatory work had been done.

1.5. Berlin Conference (September 2003)

In September 2003, approximately two years after the Prague meeting, ministers from forty countries met in Berlin and adopted the ***Berlin Communiqué.*** The Zgaga Report, which summarized the developments that had occurred between the 2001 Prague meeting and the 2003 Berlin meeting, provided the basis for much of the Berlin Communiqué.

The Berlin Communiqué reviewed the progress to date in achieving the objectives of the Bologna Process, established additional priorities for the Bologna Process, and reaffirmed the participants' commitment to the EHEA. The 2003 Berlin Communiqué was much longer and more detailed than the 1998 Sorbonne Declaration, the 1999 Bologna Declaration, or the 2001 Prague Communiqué.

The 2003 Berlin Communiqué began with a two-page, seven paragraph Preamble that elaborated the participants' goals. This Preamble took note of the conclusions of the European Councils in Lisbon (2000) and Barcelona (2002) that Europe should become "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion;" the Preamble called for "further action and closer co-operation in the context of the Bologna Process." It also stressed the importance of both social cohesion and maintaining academic values.

The second section of the 2003 Berlin Communiqué was entitled "Progress." Despite its name, this section of the Berlin Communiqué did not focus on the past or recite the progress that had been made concerning each of the six objectives in the Bologna Declaration. Instead, this section of the Communiqué focused on the future and outlined in fairly specific detail some of the steps that could be taken to achieve each of the six Bologna Declaration objectives. For example, with respect to quality assurance, the Berlin Communiqué stated that by 2005, there should be national quality assurance systems that include a definition of the responsibilities of the bodies and institutions involved; evaluation of programs or institutions, including internal and external review; participation of students and publication of results; and a system of accreditation, certification, or comparable procedure. The Berlin Communiqué further directed that there be international co-operation and networking and asked the E4 organizations—ENQA, EUA, EURASHE, and ESIB—to work together to develop an agreed set of standards, procedures, and guidelines on quality assurance and peer review. The Berlin Communiqué asked these groups to report back by 2005.

Although the Berlin Communiqué emphasized the importance of all six of the Bologna Declaration goals, it identified three intermediate objectives that it asked participants to focus on during the next two years in order to give the Bologna Process further momentum. ***These three intermediate priorities were:***

- strengthening efforts to promote effective quality assurance systems;
- stepping up effective use of the system based on two cycles of degrees, namely undergraduate and graduate degrees; and
- improving recognition of the system of degrees and periods of studies.

The third section in the Berlin Communiqué was entitled "Additional Actions" and expanded the Bologna Process objectives to include not just a two-cycle degree program (bachelors and masters), but also a three-cycle degree program that would include the doctoral degree.

In addition to expanding the objectives of the Bologna Process, the "Additional Actions" section of the 2003 Berlin Communiqué stated that a Stocktaking Exercise should be prepared for the 2005 meeting. As part of this request, the Communiqué directed that detailed reports be prepared regarding the progress achieved with respect to the ***three identified priorities:***

- quality assurance,
- the two-cycle system, and
- recognition of degrees and periods of studies.

The Communiqué also directed the participants to facilitate access to data banks, ongoing research, and research results.

The "Additional Actions" section of the 2003 Berlin Communiqué revised the criteria for membership that had appeared in the 2001 Prague Communiqué. The new criteria permitted countries who were parties to the European Cultural Convention to join the European Higher Education Area — i.e., the Bologna Process — provided they satisfied two conditions: applicant countries had to declare their willingness to pursue and implement the objectives of the Bologna Process in their own systems of higher education, and include information in their applications that explained how they planned to accomplish this. The 2003 Berlin Communiqué observed that the participants had agreed to accept seven new members, bringing the Bologna Process participants to forty.

In one of its final sections, the 2003 Berlin Communiqué significantly expanded the groups to which work was delegated. In addition to the BFUG, the Berlin Communiqué directed that a Secretariat be created, along with a Board that would oversee the work that occurred between meetings of the BFUG.382 The Berlin Communiqué indicated that both the BFUG and the Board could convene ad hoc working groups if deemed necessary.

1.6. Bergen Conference (May 2005)

The **2005 Bergen Ministerial Conference** represented the chronological mid-point in the effort to develop the European Higher Education Area. During their Bergen conference, the Bologna Process Ministers adopted three separate documents. These included the Bergen Communiqué, ***the Standards and Guidelines for Quality Assurance in the EHEA, and the Framework of Qualifications for the European Higher Education Area***. Each of these three documents is discussed below.

The Bergen Communiqué is a six-page document that contains both very general and very specific statements. One of the general statements is the Ministers' reaffirmation of their commitment to the Bologna Process principles, objectives, and commitments. Specific statements are included throughout the five sections of the 2005 Bergen Communiqué ***that address (1) "Partnership," (2) "Taking Stock," (3) "Further Challenges and Priorities," (4) "Taking Stock on progress for 2007," and (5) "Preparing for 2010."*** The Partnership section was an introductory section that stressed the central role of higher education institutions, staff, and students and encouraged these actors to intensify their efforts to establish the European Higher Education Area. This section acknowledged, however, that it takes time to implement structural curricular changes. It emphasized the need to better engage business and social partners, which was one of the recommendations of the 2005 Stocktaking Report.

Despite its name, the "Taking Stock" section of the Bergen Communiqué contained a number of new initiatives and commitments. The section began with a summary that concluded that substantial progress had been made on the three Bologna objectives previously identified as 2005 priorities. Noting that it was important to ensure consistent progress by all participants, this section emphasized the need for greater sharing of expertise at both the institutional and governmental level. This section included subsections for each of the three priority items:

- the degree system,
- quality assurance, and
- the recognition of degrees and study periods.

In each of these subsections, the Communiqué included a summary of the progress to date and identified a number of new initiatives and steps to be taken. For example, in the degree system subsection of the report, the Ministers noted with satisfaction the fact that the two-cycle degree system had been implemented on a large scale, with more than half the students being enrolled in it in most countries. They pointed out, however, that there were still some obstacles to access between cycles and that there was a need for greater dialogue in order to increase the employability of graduates with bachelor degrees.

But the “Taking Stock” section of the Bergen Communiqué went beyond a mere progress report. In this section of the Communiqué, the Ministers adopted the Framework of Qualifications for the EHEA that had been developed by the BFUG (*the EHEA Qualifications Framework*).

In addition to adopting the EHEA Qualifications Framework, the “Taking Stock” section of the 2005 Bergen Communiqué set forth an ambitious work plan. For example, the Bologna Ministers agreed to develop by 2010 a national qualifications framework for each country that would be consistent with the overarching qualifications framework the Ministers had just adopted. They further agreed to begin this work by 2007. They directed the BFUG to report in 2007 on the implementation and further development of the EHEA Qualifications Framework. Finally, this section of the Communiqué stressed the need for consultation to ensure compatibility between the Bologna Process framework and the European Commission’s proposed framework for lifelong learning qualifications.

Similar to the “Degree System” section, the “Quality Assurance” portion of the “Taking Stock” section also adopted a new document, identified new initiatives, and included a progress report. The Ministers adopted *the Standards and Guidelines for Quality Assurance in the EHEA*, which included the twenty-four quality assurance standards proposed by ENQA.

After adopting the Standards and Guidelines, the 2005 Bergen Communiqué asked ENQA to develop the practicalities for implementing these quality assurance standards and to report back on this initiative. The Ministers also committed themselves to the development of a proposed model for peer review of quality assurance agencies and welcomed the idea of having a European register of quality assurance agencies. After noting that almost all countries had made provisions for quality assurance systems based on the criteria in the Berlin Communiqué, the Ministers emphasized the need for greater student involvement and international cooperation. The Bergen Communiqué also urged higher-education institutions to continue their efforts to enhance the quality of their activities through the systematic use of internal mechanisms and external quality assurance programs.

The 2005 Bergen Communiqué subsection on recognition of degrees and study periods also included a status report and a number of new initiatives. The Ministers began this subsection by noting that most Bologna Process participants had adopted the Lisbon Recognition Convention, but urged the remaining twenty percent of participants to do so. The Ministers committed themselves to full implementation of its principles and to incorporating the Lisbon Convention into their national legislation where appropriate. They agreed to draw up "national action plans to improve the quality of the processes associated with the recognition of foreign degrees." The Ministers also directed participants to include information about their national action plans in their 2007 national reports. The Ministers "express[ed] support for the subsidiary texts to the Lisbon Recognition Convention and call[ed] upon Bologna national authorities and stakeholders to recognize joint degrees awarded" in two or more EHEA countries. They also called on participants to address the recognition problems that had been identified by the ENIC/NARIC networks.

The third section of the Bergen Communiqué was entitled "Further Challenges and Priorities." ***This section outlined a number of new initiatives that concerned the Bologna Process objectives regarding***:

1) higher education and research,

2) the social dimension,

3) mobility, and

4) the attractiveness of the EHEA and cooperation with other parts of the world.

For example, with respect to the objective regarding higher education and research, the Bergen Communiqué included a number of specific details, but also included general statements that emphasized the "importance of research and research training in maintaining and improving the quality of, as well as enhancing the competitiveness and attractiveness of the EHEA." The sections on social dimension and mobility were relatively short and expressed the Ministers' commitment to ensuring access to higher education and mobility.

The fourth section of the 2005 Bergen Communiqué was entitled "Taking Stock on Progress for 2007." This section directed the Bologna Follow-up Group to continue the stocktaking exercise first begun in 2005. It directed further stocktaking with respect to the areas of the degree system, quality assurance and recognition of degrees, although it noted that it expected these three intermediate priorities to be largely completed by 2007. This section also stated that it expected the stocktaking to be based on appropriate methodology. ***This section of the Bergen Communiqué then directed that the 2007 stocktaking process be widened to include four new topics:***

- "implementation of the standards and guidelines for quality assurance as proposed in the ENQA [R]eport";
- "implementation of the national frameworks for qualifications";
- "the awarding and recognition of joint degrees, including at the doctorate level"; and
- "creating opportunities for flexible learning paths in higher education, including procedures for the recognition of prior learning."

The final section of the Bergen Communiqué was entitled "Preparing for 2010." In this section, the Bologna Ministers acknowledged both the importance of cooperation and the size of the task they had undertaken, and the need for sustained funding. It stated that the next Ministerial Conference would take place in London in 2007 and recognized several new organizations as consultative members to the BFUG. This section also instructed the BFUG to explore the arrangements needed to support the continuing development of the EHEA beyond 2010.

1.7. London Conference (May 2007)

After the preliminary work described above, the Bologna Process Ministers met in London in May 2007 for their Ministerial Conference. ***The London Communiqué memorializes the results of their two-day program.*** The London Communiqué is a seven-page document, divided into ***four sections: "Introduction," "Progress towards the EHEA," "Priorities for 2009," and "Looking Forward to 2010 and Beyond."*** In terms of "action" items, the London Communiqué welcomed Montenegro as a new member of the Bologna Process. It also "welcomed" the establishment of a Register of European Higher Education Quality Assurance Agencies by the E4 Group based on their proposed operational model and asked them to report back regularly and to ensure that the new register was evaluated externally after two years of operation. The Ministers also adopted the strategy entitled "The European Education Area in a Global Setting" and agreed to take forward work in the core policy areas.

The London Communiqué arguably is the most content-laden of the existing Declarations and Communiqués. It also reflects the increasingly diverse perspectives of the Bologna Process participating organizations and stakeholders, as well as the need of the Ministers to respond to these differing interests and concerns.

The second section of the London Communiqué, entitled "Progress Towards the EHEA," was divided into nine subsections, many of which reflect the ten Bologna Process "action lines." The first subsection addressed "Mobility" which it described as "one of the core elements of the Bologna Process." The section noted that some progress had been made, but also noted that challenges remained and identified a number of specific obstacles, including problems with visas, problems with residence and work permits, insufficient financial incentives, inflexible pension arrangements, the lack of joint programs and flexible curricula, and the necessity of encouraging institutions to take greater responsibility for student and staff mobility and of having the mobility more equitably balanced across EHEA countries.

With respect to degree structure, the Ministers noted the good progress that had been made towards the goal of having a three-cycle degree system. The Ministers noted the importance of having curricular reform that would lead to qualifications better suited to the needs of the labor market and further study. They asked that efforts be concentrated on removing barriers to access between cycles and on implementing the ECTS properly. They also emphasized the importance of improving graduate employability and noted the need for more data collection.

The "Lifelong Learning" section of the London Communiqué observed that while the majority of countries have some elements of flexible learning, most have not developed a systemic approach to this topic. The Ministers asked the BFUG to share good practices and to work toward a common understanding. It invited the BFUG to work with ENIC/NARIC to develop proposals for improving the recognition of prior learning.

After reviewing the progress that had been made from 2005-2007, the Ministers identified their priorities for the 2009 Ministerial Conference. This section of the London Communiqué began by noting their commitment to the ongoing priorities of the three-cycle degree system, quality assurance, and recognition of degrees and study periods. ***In addition to these older priorities, the Ministers identified six areas of priority for 2009:***

- mobility,
- social dimension,
- data collection,

– employability,
– the EHEA in a global context, and
– stocktaking.

The fourth and final section of the London Communiqué was entitled "Looking Forward to 2010 and Beyond." In this section, the Ministers expressed their commitment to the EHEA and called upon the BFUG to consider how the EHEA might develop beyond 2010 and report back at the 2009 Ministerial meeting. The Ministers asked the BFUG to include proposals for appropriate support structures and decide upon the nature, content, and place of any ministerial meeting to be held in 2010. They also invited the BFUG to consider preparing a report for 2010 that would include an independent assessment of the progress of the Bologna Process, which would be done in partnership with the consultative members.

1.8. Bologna Policy Forum (April 2009)

An increasing number of countries around the world have shown their interest to be involved in a dialogue with the countries participating in the Bologna Process on how worldwide cooperation in higher education can be enhanced. At the same time there is growing interest among European countries to develop closer links with higher education systems around the world.

For the first time as part of a Bologna Ministerial Summit, Ministers of education from the 46 European countries participating in the Bologna process were joined by Ministers or heads of delegation from 15 countries from Africa, Asia, America (North and South) and Australasia as part of a ***'Bologna Policy Forum'.***

This Bologna Policy Forum took place on ***29 April 2009*** at the University of Louvain-la-Neuve (Belgium) in the framework of the 2009 Bologna Ministerial Conference. During *the forum* – which highlighted the growing interest in the Bologna process outside of Europe – participants took part in a debate on international higher education cooperation and partnership with a long-term view to developing and enhancing links between the European Higher Education Area (EHEA) and the rest of the world.

Following an exchange of views about how these countries saw the development of EHEA, a *statement* was adopted by all participants. It notes that all countries recognise the importance of public investment in higher education and its importance in sustainable economic recovery. It also underlined the importance of global sharing of knowledge, and the importance of 'fair recognition of studies and qualifications' for enhancing mobility[4].

"We note that transnational exchanges in higher education should be governed on the basis of academic values and we advocate a balanced exchange of teachers, researchers and students between our countries and promote fair and fruitful 'brain circulation'", the statement reads.

1.9. Ministerial meeting in Budapest and Vienna (March 2010)

On 12 March 2010, the Ministers of the now 47 countries participating in the Bologna Process adopted the Budapest-Vienna Declaration and officially launched the European Higher Education Area [5].

The Conference of the European Higher Education Area Ministers was followed by a meeting with Ministers from different parts of the world in the Second Bologna Policy Forum on "Building the Global Knowledge Society: Systemic and Institutional Change in Higher Education" that was concluded with the Vienna Bologna Policy Forum Statement.

The governments of Hungary and Austria were hosting a celebratory post-Bologna **Ministerial meeting in Budapest and Vienna, on 11-12 March 2010.**

This Ministerial conference had a double purpose:

On the one hand it will be to an evaluation of the Bologna Process after 10 years of Higher Education reform, as was stated in the London Communiqué already:

‘Building on previous stocktaking exercises, Trends and Bologna with Students eyes, we invite BFUG to consider for 2010 the preparation of a report including an independent assessment, in partnership with the consultative members, evaluating the overall progress of the Bologna Process across the EHEA since 1999.’ (London Communiqué, 2007).

On the other hand, it is meant to be a celebration of what will have been achieved by 2010.

At the extraordinary BFUG meeting in Slovenia (Brd, 13-14 March 2008), it was confirmed that EURASHE, together with other main stakeholders like EUA, ESU and in cooperation with the governments of Austria and Hungary would co-organize this first official post-Bologna ministerial meeting in Budapest and Vienna in 2010.

The three associations, representing the higher education institutions and the students then took the initiative to evaluate and report on the progress of the Bologna reform in their respective membership. The European Universities Association (EUA) decided to have their Spring conference on 11-13 March, and the European students Union have their pre-Ministerial Conference on 9-12 March, both events took place in Vienna. The European Association of Institutions in Higher Education (EURASHE) took the decision to organize a Convention previous to the Ministerial Meeting, in Budapest **on 10 March 2010.**

This stocktaking exercise carried out by the three consultative members of Bologna Process (EUA, ESU and EURASHE) is in line with the mandate in the London Communiqué, in that it presented the stakeholders’ point of view, as a complement to the independent assessment of the Bologna Process, the results of which were also presented at the Budapest and Vienna Ministerial meetings.

Ministers marked the priority work areas:

I. The social dimension as referred to in the Bologna Process is part of a multidimensional, political and socio-economic matrix that cannot be solved by means of education alone. Widening the access to higher education, however, will be an important step towards a more sustainable and democratic society, to which a growing number of individuals with different backgrounds can make equally valuable contributions. On the individual level the social dimension can be summarized in terms of equitable access for all.

II. National qualifications frameworks (NQFs) are designed to facilitate recognition, mobility and employability through transparency, comparability and transferability, not only between different countries but also between different sectors within a national higher education system. To fulfil this purpose, NQFs must be elaborated with a strong emphasis on learning outcomes, fully integrated into the Quality Assurance systems, and allowing a variety of learning paths to a given qualification, including informal and non-formal learning; they must be linked to recognition of prior learning; and they must be certified against widely-recognized, overarching QFs for all types and levels of higher education.

III. The employability of graduates has from the outset of the Bologna Reform process been considered as a cornerstone in developing the three-cycle structure of Higher Education, and the curricula are being adapted accordingly. The underlying concern is to make higher education more responsive to rapidly developing societies, with equally rapidly changing demands from the world of employment. This calls for flexibility and innovation in the contents as well as in the structuring of higher education programs.

IV. Lifelong learning (LLL) as a leading principle for the creation and development of the EHEA is strongly supported and advocated by EURASHE and its members, and we believe that the predominant qualities of LLL are widely found in PHE institutions and programs. For societies, LLL contributes to extending knowledge and skills and to creating new skills and transversal competences. For individuals, LLL is a major source to be flexible towards societal and professional changes or to pursue personal desires for the mere reasons of personal development and growth.

Table 1.1

Focus on higher education in Europe 2010: the impact of the Bologna process

Timeline of the Bologna process

Mobility of students and teachers	Mobility of students, teachers, researchers and administrative staff	Social dimension of mobility	Portability of loans and grants Improvement of mobility data	Attention to visa and work permits	Challenges of visa and work permits, pension systems and recognition	**Benchmark of 20 % by 2020 for student mobility**
A common two-cycle degree system	Easily readable and comparable degrees	Fair recognition Development of recognised Joint degrees	Inclusion of doctoral level as third cycle Recognition of degrees and periods of studies Joint degrees	FQ-EHEA adopted National Qualifications Frameworks launched	National Qualifications Frameworks by 2010	**National Qualifications Frameworks by 2012**
		Social dimension	Equal access	Reinforcement of the social dimension	Commitment to produce national action plans with effective monitoring	**National targets for the social dimension to be measured by 2020**
		Lifelong learning (LLL)	Alignment of national LLL policies Recognition of Prior Learning (RPL)	Flexible learning paths in higher education	Work towards a common understanding of the role of higher education in LLL Partnerships to improve employability	**LLL as a public responsibility requiring strong partnerships Call to work on employability**
Use of credits	A system of credits (ECTS)	ECTS and Diploma Supplement (DS)	ECTS for credit accumulation		Need for coherent use of tools and recognition practices	**Continuing implementation of Bologna tools**
	European cooperation in quality assurance	Cooperation between quality assurance and recognition professionals	Quality assurance at institutional, national and European level	European Standards and Guidelines for quality assurance adopted	Creation of the European Quality Assurance Register (EQAR)	**Quality as an overarching focus for EHEA**
Europe of Knowledge	European dimensions in higher education	Attractiveness of the European Higher Education Area	Links between higher education and research areas	International cooperation on the basis of values and sustainable development	Strategy to improve the global dimension of the Bologna process adopted	**Enhance global policy dialogue through Bologna Policy Fora**
1998	**1999**	**2001**	**2003**	**2005**	**2007**	**2009**
Sorbonne Declaration	**Bologna Declaration**	**Prague Communiqué**	**Berlin Communiqué**	**Bergen Communiqué**	**London Communiqué**	**Leuven/Louvain-la-Neuve Communiqué**

V. Student-centered learning and the teaching mission of higher education institutions are, both as concepts and as realities, closely intertwined with all the previous themes, i.e. the social dimension, the qualifications frameworks, employability and lifelong learning. Since the beginning of the Bologna process the role of students, teachers and their learning environment has already undergone significant change in accordance with the relatively new concept of student-centered learning.

VI. Education, research and innovation are elements in all types and levels of HE, but different HEIs focus on different aspects of education according to their mission statements. We do see, however, a continuum between academic, professional and vocational teaching and training; and similarly we see a continuum between fundamental research, innovation and applied research.

VII. International openness in HE is first of all a means to stimulate global awareness and a true sense of global citizenship and global responsibility among graduates and within the HE sector as a whole. Present-day problems are worldwide and cannot be solved in a definite geographical area like the EHEA, but require a global platform for global solutions. Moreover, the creation of the knowledge society requires global awareness and responsibility, and HEIs can play an important role here in consciousness raising and in finding solutions through internationalization of programs and study environment.

VIII. Mobility of students and staff remains an important goal of the Bologna Process. Mobility is important for sharing and dissemination of knowledge and skills among students and professionals; it contributes to the personal development and responsible citizenship of the individual; and it underpins the European identity and the multilingual tradition in a global context.

IX. Multidimensional transparency tools. Various ministerial communiqués have highlighted the diversity of European HE as an asset. A transparent, multidimensional classification system of instruments which are designed to benchmark HEIs on research and innovation, teaching and learning outcomes, services to society, level of internationalization and mobility, governance, study fees and study environment, student and stakeholder involvement, etc., may help identify and make visible such diversity.

X. Funding. Increased government funding is essential to maintain the current level of studies, but may not be enough to increase substantially the proportion of the youth that will complete a HE program. The accrued benefit for society from the education system in the form of skilled employees, entrepreneurs and independent researchers, vastly outweighs the current investment. This makes it both realistic and desirable to invest efforts and resources into education, research and innovation, not least in the light of the upcoming demographic evolvement in Europe.

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Part 2

FEATURES OF INNOVATION POLICY IN THE VISEGRAD GROUP COUNTRIES IN HIGHER EDUCATION SPHERE

2.1. Regional policy in the Visegrad Four Countries: experience for Ukraine

Relations with the countries of the Visegrad Four (V4) have always been on fundamental importance for Ukraine. First, three of the four Visegrad countries are neighboring for Ukraine with which it had historically and friendly relations. And, secondly, all four countries have become an example of successful EU membership, and therefore support and authority to advance the unification of Ukraine's European aspirations become a valuable source for borrowing useful experience.

International regional integration of Central European countries conditioned by a number of reasons: their common historical past and regional interests, geographical location and political and economic relations, similar opportunities and aspirations.

The establishment of a regional association "Visegrad Four", which includes the Czech Republic, Slovakia, Hungary and Poland, was held on February 15, 1991 in Visegrad, Hungary. In the name of the city association called "Visegrad triangle", and after disintegration of Czechoslovakia into two independent states – "Visegrad Four".

Five basic positionshave clearly defined the purpose of Visegrad association of Central European countries:

- restoration of state independence, democracy and freedom;
- elimination of remnants of the totalitarian regime in all areas of functioning society;
- formation of a parliamentary democracy and modern legal state, along with the observance of fundamental human rights and freedoms;
- creationof modern market economy;
- full integration to the European political, economic, security and legal system.

Cooperation with Ukraine has been developed both bilaterally and in the format "Visegrad Four plus". However, in some areas of cooperation, launched after the restoration of the Visegrad Group in 1998, accession of the V4 countries to the European Union, and later reinforced by promising political changes in Ukraine in winter 2004, can be considered as an impetus for more thorough cooperation.

The beginning of formal relations of the V4 with Ukraine was the meeting in the High Tatras in December 1999, when the presidents of the four Visegrad Group countries expressed their willingness to support the pro-European forces in Ukraine. Ukraine respectively proved its aspiration for cooperation with the V4 countries in the Resolution of the Verkhovna Rada of Ukraine "On main directions of foreign policy of Ukraine" in 1993.

The first step on this way was the Ukrainian-Polish intergovernmental agreement in 1993 on inter-regional cooperation. This agreement was initiated the creation of a specific segment of the international legal framework of Ukraine's cooperation with the countries of Central and Eastern Europe, including the countries of the Visegrad Four.

Analysis shows that the V4 states provide tangible political support to the European integration course of our state in the so-called "group of friends" of Ukraine in the EU, during the EU presidency, officially supporting the Action Plan Ukraine-EU. At the same time cooperation is held in various forms: strengthening intergovernmental contacts, diversifying activities in the political-security, military, energy, social and cultural spheres as well as at regional level in the “V4 + Ukraine” framework.

Modern Ukraine realizes that formation of international environment around the state secure is a prerequisite for its successful development. Acquired some dynamics Euro-regional cooperation processes, extending the space of democracy, sustainable development and security.

We know that the level of Euro-regional integration is based on shared territorial boundaries of states, which are integrated similar ways of historical development and are complemented with the natural, economic, transport and communications, scientific and technical potential, common economic problems, foreign policy and geopolitical interests. Given the emphasis placed in the Euroregional integration of Ukraine, the experience of the Visegrad Group countries is interesting and can be used to study:

- the state of Euro-regional cooperation of Ukraine in termsactivation of foreign policy after the presidential elections in 2010;
- appropriate steps of the EU concerning Ukraine, arising from the initiative «Eastern Partnership», and especially strengthen dialogue on associate membership and free trade zone;

Considering the practice of the Visegrad countries Ukraine activates its Euroregional cooperation. ***We know that there are four levels of realization of Euroregional cooperation:***

- ***international level,*** *realization of the policy of common European interests, coordination of national regional policies to attend in the balanced development of the European space;*
- ***state level,*** *development of a national development policy of Euro-regional cooperation and consistent of national interests with the European, and performed harmonization of national and regional objectives;*
- ***regional level:*** *realization of Euro-regional cooperation policies considering the interests of the state and local au-*

thorities, coordination between the regions of neighboring countries;

- ***local level:*** *coordination of development plans of local authorities, with a significant emphasis on regional and national interests, is a concrete collaboration between the actors of the border area.*

Application of our closest western neighbors and partnersinteraction practice, approved as part of «Visegrad» mechanisms, forms and types of cooperation is able to contributeimplementationof European integration strategy of the Ukrainian state, finding additional leverage that could influence on the deepening of relations with the EU and our closest neighbors.

Ukraine and the Visegrad Four

One of the important for Ukraine and the Visegrad Four countries is the issue of cross-border and interregional cooperation. Such cooperation is regarded by the parties as a part of the overall European integration process. In December 2005 an Agreement between the Cabinet of Ministers of Ukraine and the Government of the Slovak Republic on cross-border cooperation was concluded in Bratislava.

The Visegrad Four countries, as well as Ukraine, realize that this area of cooperation requires the adoption and implementation of quick and effective solutions. First of all, there is a need for a proper border infrastructure, development of mutually beneficial economic cooperation of border regions of the Visegrad Four and Ukraine.

In this context, particularly in the period from 2004 to 2006, the European Commission proposed Ukraine to launch «neighborhood programs» in order to more fruitful cross-border cooperation between Ukraine and the EU. The implementation of these programs helped to extend the active work of Ukraine and the Visegrad Four countries with the European Commission. Accordingly, the present list of «neighborhood programs» Ukraine were invited to participate in three of them: 1) cooperation between Ukraine, Poland and Belarus; 2) cooperation between Hungary, Slovakia and Ukraine; 3) cooperation between Ukraine and the countries of Central and Eastern Europe (CARDS). Program participants were given the opportunity to determine priorities for joint border cooperation and form joint management structures.

The analysis shows that at the political level, especially from the Ukraine in recent years, was heard many declarations, various intergovernmental meetings held at various levels, that have noreal and concrete results. However, we note that in this case official Kyiv still was able to take into account and analyze the experience of V-4 countries to join the EU and NATO, and feel the support of the V-4 countries of European and Euro-Atlantic aspirations of Ukraine.

Presently, cross-border and interregional cooperation between Ukraine and the V-4 countries takes place in the following forms:

- implementation of neighborhood programs;
- activities of European regions;
- activities of international and regional organizations and associations;
- interregional cooperation (cross-border cooperation agreements concluded with all countries of the V4, which involved Lviv, Volyn, Vinnytsia, Chernivtsi, Transcarpathian and other regions).

One of the key issues during all formal and informal negotiations betweenUkraine and Visegrad Four authorities for many years remains the problem of visa regime, including its liberalization.

In this context it should be noted that the policy towards possible visa liberalization between the EU and Ukraine is largely more active due to pressure from the Central European countries. And not least, because of Poland lobbying interests of Ukraine in the EU. Hungary also actively supported the changes in the agreement on visa liberalization.

Thus, the two countries signed the Agreement on local border traffic, actually made the first step towards visa-free travel between citizens of Ukraine and the EU. At the same time, as noted by European experts, a roadmap to visa-free regime for Ukrainian citizens is not a guarantee of achieving real change. In particular because plan proposed by EU has many tough conditions.

In general we can say that the results achieved by regular meetings at different levels of agreement between the V4 countries and Ukraine for a long period of time are implemented successfully.

Evidence of this is that the EU successfully implemented plan to liberalize the visa regime with Ukraine and the National Plan of Ukraine on these issues. Since July 1, 2013 operates an Agreement with the EU on a simplified procedure for issuing visas to citizens of Ukraine.

Ukraine was able to use its geographical position in Europe by identifying priority areas of cross-border cooperation in system of general regional development.

Both Ukraine and the countries of the Visegrad Group (VG) attach great importance to the development of regional and cross-border cooperation. Because Ukraine has significant potential opportunities for the development of cross-border cooperation, which is seen as a tool for development of border areas and part of the European integration process of Ukraine.

First of all it is necessary to create a modern border infrastructure, especially in the crossing points on Ukraine's border with Poland, Slovakia and Hungary.

Regional and cross-border cooperation is effective for mutually beneficial economic cooperation of border regions of Ukraine and neighboring countries, and the association of joint actions to solve environmental problems, regulating the flow of residents of border areas, employment migration. The scientist-regionalist Ye.Kish identifies the following priority areas of cooperation:

- **promotion structural reconstruction and development of depressed regions;**
- **provision of financial resources to the regions where there is stagnation of economic activity;**
- **combating of long-term unemployment and people-employment support;**

- **adaptation of entrepreneurs, workers of industry and production sector to systemic problems that threaten unemployment;**
- **financing of agricultural areas and acceleration of structural reconstruction of agriculture.**

It should be underlined that the V4 has all the opportunities to become an energy alliance that will use the geopolitical situation of member countries to coordinate transit policy. Slovakia, Czech Republic, Poland and Hungary together with Ukraine are important transit countries for Russian gas and its consumers. Significant percentage of gas supplies goes through their territories from Russia to Europe (80% of Russian and Central Asian gas to the EU, accounting for about 40% of total EU gas imports). Dependence of the region on Russian energy preserved: Slovakia almost 100%, Poland – 92%, Hungary – 90%, the Czech Republic – 74%.

V4 countries also are importers and possible transiters of electricity from Ukraine to other European countries. Main partner of "Ukrinterenergo" (State export electricity operator) to supply Ukrainian electricity in Europe is Hungarian company System Consulting, cooperation with which began in 1994 could potentially become partners for the Ukrainian side and companies of other VG countries.

According to the scientist-regionalist A. Kudryachenko, "a significant place in securing energy independence of Ukraine can have the experience of V4 countries in transition to world prices calculation for Russian energy, because before these countries, as well as Ukraine, have reduced prices on energy supply. Especially may be useful Poland experience, which has moved to market prices in 2006 ".

It is known that the European Commission (EC) has prepared 12 neighborhood programs, in three of which Ukraine takes part together with Visegrad partners:

1. Neighbourhood Programme «Poland – Belarus – Ukraine». In Ukraine extends to Volyn, Transcarpathian, Lviv regions.

2. Neighbourhood Programme «Hungary – Slovakia – Ukraine.» In Ukraine extends to the Transcarpathian region.

3. Ukraine has joined the fourth round of transnational program CADSES (the program promotes transnational cooperation for the Central Zone of the Adriatic – Danube – South East Europe). In Ukraine extends to Volyn, Transcarpathian, Ivano-Frankivsk, Lviv, Odesa, Chernivtsi and Ternopil regions.

Within interregional cooperation all regions of Ukraine have concluded cooperation agreements with neighboring territorial units of neighboring countries as well as cooperation agreements with regional authorities in neighboring countries. Such agreements have been concluded with all the countries of the Visegrad Group.

Ukraine cooperates with neighboring countries of the VG within the European regions in accordance with existing bilateral and multilateral agreements in order to solve common problems and coordinate implementation mechanisms. It is known that today in Ukraine there are six European regions, 2 of which are the territory of the Visegrad Four countries:

- «Buh» (Ukraine, Poland, Belarus);
- Carpathian Euroregion (Ukraine, Poland, Slovakia, Hungary, Romania).

In addition, Ukraine actively supports one of the last initiatives of the Council of Europe Congress to create a new Euroregion in the Black Sea.

However, on the way of implementation of the important objectives of regional cooperation in the Euroregions there are many problems, the most important of which is the lack of powers of local authorities for the fruitful cooperation and a large size of European regions, including the Carpathian Euroregion reaches more than 140 thousand square km., which affects the efficiency of its operation.

It should be noted that the extremely important for interregional cooperation between Ukraine and the EU and neighboring countries, primarily in the coordination and implementation of the strategic priorities of regional policy, which is closely related to the tasks of socio-economic development and achieving economic security, in the first place:

- compliance to liberalization course, open markets and economic integration as the basis for development and partnership;
- providing framework to address common challenges;
- policy coordination on economic modernization of partner countries;
- facilitation the mobility of people and free movement of capital, goods and services;
- strengthening stability and security on the borders, that will include the fight against illegal migration, creation of integrated border management structures, harmonized with the EU legislation;
- strengthening the capacity of law enforcement and judicial authorities in the fight against corruption and organized crime;
- development and adoption of bilateral cross-border projects and improvement of cross-border energy transit;
- fundraising programs of cross-border cooperation for generate projects to modernize domestic objects and implementation of energy efficient technologies;
- legislative empowerment of local authorities in solving problems of Euro-regional cooperation and implementation of special contractual relations – agreements on interregional cooperation.

Therefore, cooperation between Ukraine and the Visegrad Four is carried out in the political and security spheres, is an effective and promising, mostly in terms of getting incentives and assistance of Ukraine's integration to the European Union.

Border cooperation between Ukraine and the Visegrad Group

National and international legal issues of borders have always been sensitive and delicate. Noting "non problematic" of modern Ukrainian-Polish, Ukrainian-Slovak, Ukrainian-Hungarian borders scientist-regionalist Ye.Kish attracts attention to assessing of borders. In particular, she notes that "the border is a unique institution, action framework of political systems and analyzed through function of boundaries, for example, within the border region as area of new contractual relations. First of all borders have three closely related functions:

- ***firstly*** **–** set limits of state sovereignty;
- ***secondly*** **–** divide symbolic co-partnerships, ie the state, each of which has its own flag, anthem, history and so on;
- ***thirdly*** **–** divide our own (national territory) and someone else (the neighboring territory), and then the whole world».

Additional information

Ukrainian-Polish border

The length is 526.2 km. It is the most powerful new external border of the EU since May 2004 in Central Europe.

Ukraine and Poland on May 18, 1992 in Warsaw signed an Agreement on good-neighborliness, friendly relations and cooperation. The Agreement established a framework and common rules of cooperation in various fields of cooperation and affirmed principles such as the inviolability of borders, territorial integrity, peaceful settlement of disputes, non-interference in internal affairs, respect for human rights and fundamental freedoms, equality and rights of peoples, cooperation and conscientious implementation of international obligations. It is assumed that the parties will increase the number of border crossings and will improve border and customs control.

Of great importance are provisions of Article 10 of aforementioned Agreement on cooperation of the two states, directly *in border policy and border infrastructure development and regional cooperation.*

Today on the Ukrainian-Polish border has 12 checkpoints, six for car traffic, six for railway communication, namely: «Yagodyn – Dorohusk», «Yagodyn – Dorohusk – railway station», «Ustyluh – Zosin», «V. Volynskyi – Zosin – truck station», «Rava-Ruska – Hrebenne

«, «Rava-Ruska – Hrebenne – railway station», «Shehyni – Medica», «Mostyska – Medica – railway station», «Smilnytsia – Krostsenko», «Khyriv – Ustishki Dolna – railway station».

<u>Ukrainian-Slovakborder</u>

Thelengthis 98.5 km.

The Agreement on good neighborhood, friendly relations and cooperation between Ukraine and the Slovak Republic was signed in Kyiv on June 29, 1993 and determined (Article 1 the Agreement) that the Contracting Parties will develop their relations as friendly states on the basis of sovereign equality, territorial integrity and political independence, inviolability of existing borders, peaceful settlement of disputes, non-interference in internal affairs and others.

<u>Today the Ukrainian - Slovak border has fivecrossingpoints:</u> «Malyi Bereznyi – Ubľa», «Uzhhorod – Vyšné Nemecké», «Pavlove – Maťovské Vojkovce», «Chop (Strazh) – ČiernanadTisou», «MaliSelmentsi – Veľké Slemence». Also carried out development of crossing point "Solomonovo – Čierna nad Tisou".

<u>Ukrainian-Hungarian border</u>

The length of the border is 135.1 km.

Regulatory and legal basis of bilateral cooperation between Ukraine and Hungary is an Agreement on Friendship and Cooperation, signed on December 6, 1991. In accordance with the aforementioned agreement Ukraine and Hungary should build their relations, following the principles of sovereign equality, territorial integrity and political independence , inviolability of existing borders, peaceful settlement of disputes, non-interference in internal affairs, respect for human rights and freedoms.

<u>Today there are 7 checkpoints on the Ukrainian-Hungarian border:</u> "Chop (Tisa) – Záhony", "Chop (Druzhba) – Záhony", "Salovka – Yeperyeshke", "Dzvinkove – Lonja", "Kosyno – Barabash", "Luzhanka – Beregshuran", "Vylok – Tysobech". Also, negotiations are carried out on the construction and opening of crossing point "Velyka Palad – Kish Palad".

Analyzed status of relations between Ukraine and members of the Visegrad Four, which are neighbors of Ukraine according to new EU-Ukrainian border, gives reason to believe that bilateral cooperation is mutually beneficial and useful. At the regional level cross-border cooperation with Poland, Hungary and Slovakia is developed mainly through bilateral format of Euroregional cooperation.

In addition, it should be noted that the segmentation must occur more active in cooperation within the Carpathian Euroregion and simplification of procedures for international technical assistance to Ukraine and creation of effective system of mutual information on common environmental problems and the liberalization of the visa regime with Ukraine. These and other efforts of bilateral euroregional cooperation are able to significantly raise the level and results of cooperation between Ukraine and the Visegrad Group and each of its states.

Consequently, close historical ties and today's common foreign policy goals of Ukraine and the Visegrad Four laid the foundation for effective development of good neighborly relations at the present stage and created massive opportunities for further cooperation in the future. Arguably, the Visegrad-Ukrainian relations are rather balanced, as evidenced by the successful implementation of bilateral and multilateral agreements achieved after the regular meetings at all levels. All this creates a solid foundation for further expansion of this cooperation on interests of both parties.

Considering analysis, it can be admitted that the Visegrad countries developed quite flexible and diverse external relations and cooperation with Ukraine within the framework of good neighborly formulation and implementation of EU policies. These are the following main areas of cooperation between Ukraine and the Visegrad:

1) ensuring solidarity support of the European integration aspirations of Ukraineby Visegrad countries;

2) Visegrad countries experience transfer of their European integration to Ukraine;

3) coordination of foreign policy of Ukraine and the Visegrad Group on bilateral and multilateral basis;

4) formation of multilevel cooperation mechanism of the Visegrad and Ukraine in the form of Ukrainian representatives participation in meetings of different structures of the Visegrad and specially created commissions;

5) distribution of the Visegrad Fund programs for Ukraine.

Along with the mentioned areas of cooperation between Ukraine and the Visegrad the importance of regional cooperation should be highlighted, which is especially important for use in- practice of local government and introduction in practice of new elements for Euro-regional cooperation of Ukraine, considering, that cooperation contributes to:

- better understanding of the prospects of interregional and cross-border cooperation of Ukraine with neighboring EU countries;
- implementation of the main principles of EU regional policy in the national legislation of Ukraine;
- establishment of respective border infrastructure according to the specific administrative division of Ukraine and others.

Delineated list of cooperation between Ukraine and the Visegrad group was reinforced by concrete proposals and decisions in areas such as political cooperation, trade and economic cooperation, cooperation in justice and internal affairs, transport infrastructure, energy and communication, as well as culture, education, mutual contacts between people.

In particular, cross-border cooperation offers promising potential. Ukraine and the Visegrad Four together have implemented several projects, enabling co-operation, for example, between regions, towns and villages, as well as citizens at all levels. This cooperation has brought good results to participants, more useful than different political declaration.

The list of these objective and subjective factors lies in both spheres, such as: unsatisfactory rate of structural and economic reforms in Ukraine and approximation of legislation, norms and

Table 2.1

Topics of international scientific research conferences

No.of the conference Conference topic Date and venue	**Number of partic-ipants**	**Pub-lished reports**	**Number of au-thors**	**Participating countries**
I. Human rights and freedoms and modern social progress (24-25 February 1999, Uzhhorod)	120	75	91	Ukraine, Russia Slovakia
II. Theory and practice of transition to the market: economic, legal, international and information-technological aspects (27-30 March 2001, Snina, Slovakia)	55	43	51	Ukraine, Slova-kia, Hungary Russia, USA
III. Theory and practice of transition to the market: economic, legal, international and information-technological aspects (10-12 April 2002, Snina, Slovakia)	42	38	46	Ukraine, Slova-kia, Hungary Russia, USA
IV. Problems of development and management of integration processes in the international market of Education and Sci-ence (16-18 October 2002, Snina, Slovakia)	43	41	51	Ukraine, Slova-kia, Hungary, Russia
V. Theory and practice of transition to the market: economic, legal, international and information-technological aspects (12-15 March 2003, Snina, Slovakia)	52	37	47	Ukraine, Slova-kia, Hungary, Russia

VI. Problems of development and management of integration processes in the international market of higher education and science (15-17 October 2003,Snina, Slovakia)	71	39	49	Ukraine, Slovakia, Hungary, Poland, Czech Republic, Russia, USA
VII. Problems of Adaptation of Higher Education of Ukraine to European standards and principles of the Bologna process (23-26 March 2004,Snina, Slovakia)	69	35	48	Ukraine, Slovakia, Czech Republic, Hungary
VIII. EU Enlargement: new realities and prospects in the international market of higher education and science (24-27 November 2004,Snina, Slovakia)	62	36	48	Ukraine, Slovakia, Hungary, Poland, Romania
IX. State, problems and prospects of Ukraine's integrationto the European educational and research area (12-15 April 2005, Snina, Slovakia)	40	33	44	Ukraine, Slovakia, Hungary, Poland, Romania, France
X. Theory and practice of European integration processes in higher education and science (1-4 November 2005,Snina, Slovakia)	74	50	70	Ukraine, Slovakia, Hungary, Poland, Romania
XI. Professional training of specialists in terms of innovative restructuring of Ukrainian national education (16-19 May 2006, Snina, Slovakia)	41	32	40	Ukraine, Slovakia, Hungary, Germany, Romania, Poland

XII. Problems of national qualifications system development in the European higher education area (24-27 October 2006, Snina, Slovakia)	78	79	83	Ukraine, Slova-kia, Hungary, Poland, Romania
XIII. (February 2007)	Carried out in TSU as methodical and educational with the publication of materials collection			
XIV. Modern information technologies and innovative meth-ods of training professionals on the international market of higher education (17-20 April 2007, Snina, Slovakia)	77	61	64	Ukraine, Slovakia, Hungary
Istudents. Modern information technologies and innovative methods of training professionals on the international market of higher education (17-20 April 2007,Snina, Slovakia)	28	10	11	Ukraine, Slovakia
XV. Innovations in the educational process of higher education institutions: international and national experience (06-09 November 2007,Snina, Slovakia)	65	55	68	Ukraine, Czech Republic, Slo-vakia, Hungary, Poland, Romania
II students. Newadvances in science, technology and educa-tion: national and international experience (06-09 November 2007,Snina, Slovakia)	15	12	12	Ukraine, Czech Republic, Slova-kia, Hungary
XVI. Lisbon Strategy as a determining factor to European inte-gration of education and research (06-09 May 2008, Hyrlyany, Slovakia)	84	68	31	Ukraine, Slova-kia, Germany, Hungary, Poland, Czech Republic, Romania

III students. Lisbon Strategy as a determining factor to European integration of education and research (06-09 May 2008, Hyrlyany, Slovakia)	26	26	26	Ukraine, Slovakia, Poland, Hungary, Czech Republic, Romania
XVII. Problems of qualification systems formation and modern trends in professional competence of specialists development: national and european dimensions (18-21 November 2008, Snina, Slovakia – Miskolc, Hungary)	60	44	68	Ukraine, Slovakia, Poland, Hungary, Czech Republic, Romania
IVstudents. Problems of qualification systems formation and modern trends in professional competence of specialists development: national and european dimensions (18-21 November 2008, Snina, Slovakia – Miskolc, Hungary)	30	26	16	Ukraine, Slovakia, Poland, Hungary, Russia
XVIII. Domestic and foreign experience of the Bologna system implementation: successes and problems (5-8 May 2009,Snina, Slovakia –Miskolc, Hungary)	75	35	68	Ukraine, Slovakia, Hungary, Poland, Romania
Vstudents. Integrative processes in the European educational and research area (5-8 May 2009, Snina, Slovakia – Miskolc, Hungary)	25	25	16	Ukraine, Slovakia, Hungary
XIX. Perspective directions and ways of implementation innovative technologies in European higher education system (8-11 December 2009, High Tatras, Slovakia)	61	43	69	Ukraine, Slovakia, Hungary, Poland, Romania
VIstudents. Innovations in the European higher education system (8-11 December 2009, High Tatras, Slovakia)	22	22	16	Ukraine, Slovakia, Hungary

XX. International cooperation in the implementation of innovative training technologies in higher education (11-14 May 2010, Kosice, Slovakia – Miskolc, Hungary)	95	65	90	Ukraine, Slovakia, Hungary, Poland, Romania
VIIstudents. International cooperation in the implementation of innovative training technologies in higher education (11-14 May 2010, Kosice, Slovakia – Miskolc, Hungary)	60	36	36	Ukraine, Slovakia, Hungary
XXI. Perspective ways and directions of improving educational system in the light of the Bologna process (16-19 November, Kosice, Slovakia – Miskolc, Hungary)	68	64	78	Ukraine, Slovakia, Hungary, Poland, Romania
VIIIstudents. Perspective ways and directions of improving educational system in the light of the Bologna process (16-19 November, Kosice, Slovakia – Miskolc, Hungary)	42	42	57	Ukraine, Slovakia, Hungary,
XXII. Modernisation of European higher education in the context of the Bologna Process (17-20 May 2011,Kosice, Slovakia –Miskolc, Hungary)	76	80	96	Ukraine, Slovakia, Hungary, Poland, Romania
IXstudents. Modernisation of European higher education in the context of the Bologna Process (17-20 May 2011,Kosice, Slovakia –Miskolc, Hungary)	15	15	15	Ukraine, Slovakia, Hungary
XXIII. Current Problems of International Cooperation in Higher Education (29 November – 2 December, 2011,Kosice, Slovakia – Miskolc, Hungary)	97	64	74	Ukraine, Slovakia, Hungary, Poland, Romania
Xstudents.Achievement of students science: realities, problems and prospects (November 29 – December 2, 2011, Kosice, Slovakia – Miskolc, Hungary)	29	29	29	Ukraine, Slovakia, Hungary

XXIV. Problems of university education internationalization in the context of European integration (08-11 May 2012, Kosice, Slovakia –Miskolc, Hungary)	71	70	97	Ukraine, Slovakia, Hungary, Czech Republic, Russia, Poland, Romania
XIstudents. Achievement of students science: realities, problems and prospects (08-11 May 2012, Kosice, Slovakia – Miskolc, Hungary)	33	25	30	Ukraine, Slovakia, Hungary
XXV. Innovative potential of European higher school in globalization transformations of the XXI century (27-30 November 2012, Kosice, Slovakia – Miskolc, Hungary)	80	70	92	Ukraine, Slovakia, Hungary Czech Republic, Russia, Romania, Poland
XIIstudents. Scientific completions of young scientists in the context of European educational area development (27-30 November 2012, Kosice, Slovakia– Miskolc, Hungary)	42	20	25	Ukraine, Slovakia, Hungary
XXVI.The development of a single European educational area: a combination of international experience with national traditions (21-24 May 2013,Kosice, Slovakia – Miskolc, Hungary)	85	73	97	Ukraine, Slovakia, Hungary
Totalparticipants: • professors and lecturers • students	1666 339	1257 298	1625 313	
Total	2005	1555	1938	

standards of Ukraine to those existing in EU, on the one hand, and slow liberalization of visa policy, of these countries regarding citizens of Ukraine and the lack of EU financial support offered by the Visegrad Group, development programs and more.

At the same time, as practice shows, very important and useful for the parties is systemic **joint discussions** about forms and methods of implementing the Bologna Declaration that over the last years are being realized at the joint international scientific and practical conferences given in **table 2.1.**

2.2. Innovation policy in the Visegrad Group Countries in higher education and scientific sphere

2.2.1. Definition "innovation": historiographical review of the issues

The term «innovation» comes from the Latin word «innovatio, novo» (modify, renew, invent) and means the introduction of new. In modern scientific literature innovation is generally considered as new form of work organization and management, new types of technologies, which cover not only various institutions and organizations, but also certain area of social life of people.

Historical sources of *educational innovations* related to the period of experimental pedagogy birth in the second half of the nineteenth century. Since the 60s of the last century phenomenon of «innovation» has become a key characteristic of the post-industrial structure – its formation and development.

The issue on*innovative educational activitiy* has starting point by determining the content of the terms «innovation», «innovative project», «innovative culture», «educational innovation», «innovative educational activity», which allows to set essential peculiarities of innovative processes in the education system. ***Thus, we can assume, that educational innovationsis firstly created, improved or applied educational, didactic, pedagogical and***

managerial systems, their components that significantly improve the results of educational activity.

Therefore, *innovation* should be considered as implemented innovations in education: in content, methods, techniques and forms of training and education of the individual (techniques, technologies), in sense and forms of organization management of educational system and the organizational structure of educational institutions, in means of training and education and in approaches to social services in education, which significantly improve the quality, efficiency and effectiveness of the educational process that goes through various stages, including:

- identifying needs for change (identifying the problem);
- development of ideas to solve the problem;
- developing a way to solve problems (innovation);
- testing and expertise of innovations;
- mastering of innovation;
- institutionalization of innovation.

Innovative process begins with identifying the need for change in certain areas of educational process in high school, which is due to the analytical work of specialized scientific organizations, education authorities, heads of universities, scientific and educational groups.

Modern national scientists consider innovation in education as:

- the process of creation, distribution and use of new products (innovation) for the solution of educational problems that have been dealt in a different way before;
- the result of original creative search for nonstandard solutions for various educational problems;
- topical, meaningful and systemic ideas arising from various initiatives and innovations that are becoming promising in the context of the evolution of education and its positive impact on development;
- products of innovative educational activities, characterized by the creationand use of new product (innovation) in Education and Research;

- various innovations in the activities of educational institutions in performing training and educational process.

Among the priorities of educational innovations in universities are the following:

- introduction of modular education and rating system of knowledge control (credit-modular system)in the educational process;
- distance learning system / e-learning system;
- computerization of library programs with using the e-catalog programme and creating a fund of electronic educational and teaching and methodological materials;
- electronic system of educational institution activities and educational process management.

Avariety of innovative pedagogical methods, which are based on interactivity and maximum proximity to the real professional activities of future specialist are successfull used in educational process, including:

- imitative technologies (playing and discussion forms of organization);
- technology of «case method» (maximum proximity to reality);
- method of video training (maximum proximity to reality);
- computer modeling;
- interactive technologies;
- collective-group learning technology;
- technologies of situational modeling;
- technologies of controversial issues processing;
- design technology;
- information technologies;
- technologies of differentiated training;
- text-centric technology of training and others.

A number of innovative forms of educational process, technologies of education are closely connected with the creation of innovative tools in higher education institutions for creative activity of students and lecturers, ie material and technical support. Computerlabs with Internet access are extremely important in terms of intensive innovative learning technologies.

The basis for innovative activity of the modern lecturer is to develop innovative software methodical complex on a discipline. Along with the software and content providing of discipline the use of information resources and their didactic property stands in the first place.

It provides a visual and imaginative presentation of information, create video library to illustrate information material, lecture notes, e-lectures, which can combine slideshow of text and graphic support (photos, diagrams, pictures) with computer text animation, showing documentaries records. It combine technical capabilities: computer and video-technical with live communication of lecturer and audience.

The paradigm of innovative development of higher education provides way to organize activities of the higher education institution, which ensures the achievement of goals and objectives of its innovative activity.

A key element of this paradigm are knowledge, as for traditional paradigm, the main difference is that if the previous approach figured out a way to transfer knowledge, the new approach focuses on the method of their production. The innovative higher education institution requires new approaches both in management and in the organization of the educational process.

In April 2004 in Liege (Belgium) European Commission hosted an international conference on scientific research and innovative activities in universities. About 1,000 participants: officers and executives of academic organizations, industrial companies, politicians and representatives of government in Europe, USA, Australia, Africa and Asia have taken part in the scientific forum, which defined the prospects of development of science and innovative activity in Europe for the next 15 years.

A completely new format of the definition of "innovation" as the conversion of new knowledge into economic and social benefits was presented. Innovation became solely the product of scientific research or technology. The result of innovative activity today depends on organizational, social, economic and other factors. Thus, the nature of innovation is changing, in fact, like the economy itself, claiming for status of knowledge economy.

The Eurostat and the OECD have developed a joint definition of innovation based on various studies and consent between scientists.

Definition of innovation (OECD, 2005):

The implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practice, the workplace organisation or external relations [45].

Distribution of innovation requires its replication and brings information about it to potential users. Existence of special infrastructure for support of innovative educational processes promotes its distribution. It includes a variety of consulting services, training centers, experts, centers on implementation and more. In order for dissemination of innovation has been successful, it is necessary to analyze how it occurs, to identify factors that inhibit this process, and implement measures to address them.

Before the decision on implementation of innovations, information of which came from outside, innovation must pass an internal examination. Not always the innovations that are suitable for one higher education institution, can be used in another. Therefore, the examination carried out during the creation of innovation and expertise, conducted at the stage of its assimilation, have both common and different features.

The signing of the EU-Ukraine Association Agreement – a new step towards integration to the European educational and research area through innovative development of Ukrainian higher education [37]. Should be noted, that the key element in the new Law of Ukraine "On Higher Education" is ***innovative component*** of higher educational institutions. Particularly, in Articles

65,66,67,68 defined organizational and legal forms of innovations implementation, made changes on the financial autonomy of higher educational institutions.

Implementation of the law will promote the integration of Ukraine into a unified educational space, without which it is impossible to raise the issue of the world recognition of Ukrainian diplomas, continuing the education for students and postgraduate students in foreign universities, conduct training of highly qualified professionals able to defend the interests of the state in present complex geopolitical conditions.

The center of this paradigm is education that develops as a response to the challenges of civilization and also in response to the human needs to find its place and the possibility of fulfillment in the new global environment. Education, its organization, development directions, content and educational technologies are in the midst of discussions that unfolded today in the global intellectual environment.

This is the development of a new philosophy of education – education that would ensure the comfort of human existence in the XXI century. The Western world is trying to cover its by Bologna Declaration. And although the main directions of education development they have identified very promising, it is still remain more questions than answers. The problem of general philosophy of education gradually adopted as the main problem of the modern world education policy.

Note that the issues of innovative university was comprehensively developed by a lot of researchers in Europe, America and Asia. In particular, important to us are the researches of scientists from the Visegrad Group countries. For clarification and understanding of the term «innovation» consider the existing approaches to its definition. **Table 2.2** contains the determination of scientists and researchersfrom the Visegrad Group countries, which professionally engaged in innovation.

Table 2.2

Basic approaches to the definition of «innovation» by researchers of the Visegrad Group Countries

Country	Author (s)	Source (s)	Definition of the term
1	**2**	**3**	**4**
Poland	J.Dombrowski and J. Kaladkevych	The innovative practice of Polish enterprises [19]	Innovations are considered by taking into account three main parameters: - the sphere to which they relate, - the method of implementation and - the object changes that they cause. Thus the process of creating innovations, in their opinion, should take into account the implementation of three phases that come one after another: opening (appearance of a new idea), the first of its use, distribution of use and implementation of ideas and solutions.
	Fabian Andrushkevych	1. Innovations in Polish and Ukrainian education as a result of signing declarations of European education: comparative analysis [4] 2. The main directions and forms of Ukrainian-Polish academic cooperation [5] 3. Polish «educational breakthrough» and its significance for the Ukrainian educational innovations [6]	Analyzes innovations and model of modern system of academic education. Underlines that educational reforms of Poland based on the principles of democratic education system that reflect the specific of the country, and are reflected in the *Law "On education system"*, adopted in 1991 by the Sejm of Poland.

	Alexandr Bonkovski, Michal Klepka, Krzysztof Matusiak, Jerzy St-shelyets, Krzysztof Zasyadly	Tools for innovative support of SMEs: the experience of Poland and the European Union [9]	Effective innovative policy should be targeted to the needs, have prolonged nature, reach critical mass and based on a real basis. The basic aspects of a regional approach to economic development and building regional innovation strategies. Presented practical example of this strategy, described a role of innovative centers and development of innovation.
Slovakia	F. Valyenta	Creative activity – innovations – effect [10]	Innovation – changes in the original structure of production organism, ie transition of its internal structure to a new state.
	L.Vodachek-andO. Vodachkova	The strategy of innovation management at the enterprise [15]	Innovation – target change in the functioning of the company as a system.
Czech Republic	I. Perlaki	Innovations in Organizations [32]	Innovation – is any purposeful, positive and progressive change of tangible and intangible elements (parameters) of the organization, ie any change that promotes development, growth and improvement of the efficiency of the organization. Because of this innovation is not random, not natural changes, but the result of conscious, purposeful activities of the organization.

	A special place in the study of innovative educational policy of the Czech Republic occupied periodicals. Publications by the Network of Institutes and Schools of Public Administration in Central and Eastern Europe (The Network of Institutes and Schools of Public Administrations in Central and Eastern Europe - NISPAcee) and documents of the Program SIGMA (Support for Improvement and Management in General and Eastern European Countries) allow you to get acquainted with the educational policy, reforms in public administration, administrative reform, public policy in Central and Eastern Europe. [38]		
Hungary	B. Santo	1. The power of innovation self-development [33] 2. Innovation as a tool for economic [34]	Innovation – is a socio-techno-economic process through which the practical use of ideas and inventions leading to the creation of the best in quality products, technologies and makes a profit (in the case when innovation is focused on economic benefits), its appearance on the market can bring additional income. Creation and implementation of competitive technological advantages.

Thus, the methodological analysis of the previous research of innovative activity allows discovering the specificity of innovation in higher education, substantiating its innovative development paradigm, in which the emphasis is not on transfer mode, but on the mode of production of knowledge. The conceptual basis for this paradigm makes centrist culture and competency approaches and context training theory.

Analysing the experience of implementation of modern technologies in training shows that innovative processes in higher education promotes not only a significant increase of theoretical and practical training of students, trainees, but primarily methodological reorientation of educational institutions on the person, become the basis of a new philosophy of education.

For Ukraine, the innovative potential of high school could and should become a resource for modernization breakthrough for the development of high-tech industries, advanced scientific fields, formation of modern social and cultural standards of living.

Problems of innovative activity in education of Ukraine devoted a lot of researches of leading scientists, including L. Huberskyi, M. Zgurovskyi, V. Kremen, V. Luhovyi, Zh. Talanova, Yu. Rashkevych, E. Piechota and others. Considering that they are the developers of the Law of Ukraine "On Higher Education" and national experts on monitoring the status of its implementation, they used her research on innovative development of higher education in the formulation of the basic provisions of this law that is extremely important.

After the adoption of the Law of Ukraine "On Higher Education" innovation issues in higher education took the first place, given the priority of integration to the European educational and research area. Therefore, the study and implementation of university education experience in Europe, especially the Visegrad Group countries is an important prerequisite for the use of innovative processes in higher education of Ukraine.

2.2.2. Institutional and legal support of innovative activity in higher education and scientific sphere

The most important sources of information concerning innovation and innovative companies in Europe, are the following:

- **Community Innovation Survey (CIS) [41] –** international program of statistical research of innovations, implemented on the initiative and under the auspices of the European Commission;
- **European Innovation Scoreboard [44] –** includes innovation indicators relating to issues such as human resources for science and technology expenditures on activities in the field of research and development, patent activity and others. Based on these indicators was designed by the European Commission "integral indicator of innovation", which is used to determine the effectiveness of innovation EU Member States;
- **European Report on innovation –** a document which shows at what level of innovativeness is every member of the EU and what steps it should take to increase the effectiveness of innovations.

In 2000, in the Visegrad Group Countrieswere adopted documents in the field of innovation policies (Hungary, Poland, Slovakia, Czech Republic) aimed at targeting these countries in scientific and technical and innovative development. These documents highlights the main directions of innovative strategies and programs of national innovative leaders based on large enterprises, holding companies, high-tech industries that have a priority to create a national model of industrial growth.

SLOVAKIA

Since 2007 the government of the Slovak Republic has approved a number of strategic documents on science, research and development as well as technology and innovations. The most important are:

1. The Long-Term Plan of the State Science and Technology Policy for 2015 [48];

2. The implementation strategy for the Long-Term Plan of the State Science and Technology Policy for the period 2015 to 2020;

3. Update of the Long-Term Plan of the National Science and Technology Policy for 2015 (Phoenix Strategy);

4. Minerva 1.0 (2005 - 2010) and Minerva 2.0 (2011 - 2015) [46];

5. Innovation Strategy of the Slovak Republic for the period 2007-2013;

6. Innovation Policy of the Slovak Republic for the period 2008-2010;

7. Innovation Policy for 2011 to 2013 within the framework of the Ministry of Economy of the Slovak Republic [46].

Strategies adopted in V-4countries, do not always have clear guidelines for policymakers. Their fragmentation and delay in adopting innovative policies have made inconsistent and ineffective. Nevertheless, even if the structure of strategic planning is clear, as is the case with Poland, other problems such as lack of management or providing financial resources to achieve specific goals may still occur.

Key legislative institutions – the Ministry of Economy and Ministry of Education, Science, Research and Sport of the Slovak Republic (SR) with a relatively wide network of institutions. The Ministry of Economy is responsible for innovation policy, while the Ministry of Education, Science, Research and Sport is responsible for research and development.

Government agencies under the Ministry of Economy include:

1. Slovak Innovation and Energy Agency (SIEA).

2. State Agency for Investment and Trade Development (Capio).

3. SlovakBusinessAgency (SBA).

4. Innovation Fund.

Government agencies under the Ministry of Education include:

1. Scientific scholarships agency (VEGA).

2. Scientific development agency.

The Government Council for Science, Technology and Innovation is a permanent expert, consultative and coordinating body of the Government on science, technology and innovation.

In addition, other ministries are also designed to promote research and development work. For example, the Ministry of Internal Affairs and Ministry of Defence has several institutions involved in research activities. Ministry of Environment Protection is the founder of several research institutes: Slovak Hydrometeorological Institute, the Research Institute of Water Resources and the State Geological Institute. For a long time the main participants among these was the low level of cooperation and synchronization of actions.

An important step towards more efficient policy coordination STI (science, technology, innovation), was made in 2013 with the adoption of science-oriented strategy of the Slovak Republic *(Smart Specialisation Strategy of the Slovak Republic)*. This document is a consensus that was achieved with the participation of scientists, entrepreneurs, business clusters, regional government agencies, civil society structures and joint consultations with foreign experts of the European Commission.

Science-oriented strategy (Smart) is a new installation of a modern system of management of STI policy. The main body to manage the implementation RIS3 is the State Council for Science, Technology and Innovation. The Standing Committee of the State Council for Science, Technology and Innovation will be established as a working body of the key government issues. Other ministries and central government will also participate in this process. The existing network of executive agencies will be transformed into two separate bodies: the Agency for Research and Technology Agency. They provide implementation RIS3.

HUNGARY

In connection with the permanent political and social changes in the country, the government cannot comply constant rate of innovation policy, which in turn makes concrete progress in this field. And, despite this, the present policy of Hungary in the field of STI entitled "National Strategy for Research, Development and Innovation" (2013-2020 biennium.) (National Research and Development and Innovation Strategy (2013-2020))states:

- The creation of regional innovation systems;
- The main features in the international innovation environment;
- Offers a performance review of STI;
- Highlights the strengths and weaknesses, based on figures for 2011;
- Discuss strategic options;
- Represents a vision and sets goals of STI.

In Hungary, one of the first regions, which based on the international experience of the RIS and<u>prepared strategy to improve the innovation system was Western Transdanubia [46].</u> This strategy was aimed at mid ten years, whose aim was to prepare and efficient management and new RIS network. **Its main tasks were:**

- The creation of new institutions for the innovation system and improving existing ones, as well as their integration into the network;
- Improving business innovative activities through organizational programs to stimulate innovation;
- Providing additional support for the production of high technology products and products with high added value.

An example for Ukraine may be the fact that the implementation of the aforementioned strategies were created several organizations. The coordinators of the first phase of implementation of innovative strategies were West Pannon Regional Development Council (WPRDC) and West Pannon Regional Development Agency (WPRDA). The implementation of the strategy and the priority of government policy to decentralize power in Hungary at the end of 2004 along with four other regional organizations WPRDA founded the West Pannon Regional Innovation Agency (WPRIA), and already in the first half of 2005, followed by West union was established Pannon Regional Innovation Council (WPRIC).

Thus, for 13 years direct foreign investment in Western Transdanubia introduced new technologies and new management methods, increased qualification of the local workforce and the level of innovation potential. This region, unlike other areas of Hungary, were created new organizational models, industrial parks, innovation centers and incubators, new forms of small and medium-sized businesses, cluster organizations to enhance cooperation and so on.

POLAND

In 2006 the Polish government adopted (independently from the EU) **the National Development Strategy 2007-2015 [46].** This document outlined the development goals for Poland while at the same time giving a realistic framework for the receipt and use of EU funds. On the basis of this strategy the second programme, *Guidelines for increasing economic innovativeness for 2007-2013,* was adopted. Following the Lisbon Agenda it aimed at transforming Poland into a **"knowledge-based economy".**

The current Polish innovation policy is directly derived from a document entitled *Europe 2020: A strategy for smart, sustainable and inclusive growth*.

STI policy in Poland is mainly developed by two ministries: the Ministry of Economy and Ministry of Science and Higher Education.

Ministry of Science and Higher Education, in its turn, has created two departments responsible for maintaining STI policy in Poland:

1. National Center for Research and Development (NCBiR), which is responsible for applied science, and

2. National Research Center (NCC), which is responsible for fundamental science.

Besides targeted programs that support innovation, the ministry also assumes primary responsibility for managing the Polish regional innovation systems (RIS), which co-financed from EU structural funds related to the planning of innovative activities in the period 2014-2020.

Foundation for Polish Science also plays an important role. The Fund is a non-governmental, non-political and non-profit organization created and maintained at the expense of the state budget. Its main objective is to support the Polish science through various grants, prizes and scholarships. He is also responsible for the distribution of funds from the structural funds related to the system RTDI.

According to the law "On the scientific research organizations" ***research institutions are:***

- research institutions;
- research centers, central laboratories and other organizations, whose main task is to conduct scientific research.

The main institutions involved in innovative activities include:

1. The Ministry of National Education of Poland.
2. The Ministry of Economy of Poland.
3. The Ministry of Regional Development (Ministerstwo Rozwoju Regionalnego).
4. Institute of knowledge and innovation RP (Instytut Wiedzy i Innowacji).
5. Integris – Association of regional innovation strategies (Sie Regionalnych Strategii Innowacji).

Scientific and technical priorities

The main priorities of innovative development programs are:

1. Research and development of modern technologies. For this area corresponds to the Ministry of Science and Higher Education (MNiSzW).
2. Strategy for Innovation and economic efficiency, "Dynamic Poland 2020» (Strategy for Innovation and Efficiency of the Economy: "Dynamic Poland 2020").
3. National Research Programme [9].
4. Infrastructure in research and development (responsible MNiSzW).
5. Capital for Innovation (responsible – Ministry of Economy (MG)).

6. Investments (responsible MG).

7. Distribution Innovation (responsible MG).

8. Polish economy on the international market (responsible MG).

9. Technical Assistance (responsible Ministry of regions development (MRR)).

In addition, as some experts still direct participation in the innovation of the Polish government and the business sector led to some inefficient decisions (Gadomski, 17.3.2014). Investments in innovation, which are closely controlled by public authorities is not as effective as those made without the participation of politicians.

CZECH REPUBLIC

First **National Innovation Strategy (NIS) [56]**, adopted in 2004, after the Czech Republic's accession to the EU (where pan-European innovation are considered a priority task in the conditions of growing competitive pressures in the global economy), is a breakthrough compared to the traditional approach to innovation policy.

Today the high level of Czech modern science has achieved thanks to the active support of the state and reform of the scientific system. Government of the Czech Republic was defined objectives and priorities of modern scientific and innovation policy. Key issues related to the principles, form of organization and management of R&D, popularization of Czech science settled by legal documents.Among them should be noted the following Programs:

- "National scientific and research policy for 2009-2015." [57];
- "Basic Principles of the Czech Government in science and technology."

These regulations clearly define the role of research in the Czech Republic, the functions of the state and established the basic principles governing the activities of the government in the field of science and technology. In September 2011 the Czech government approved regulations: **"International competitiveness strategy in the Czech Republic", "National Strategy for Innovation",** prepared with the participation of the Ministry of Industry and Trade, the National Economic Council, as well as experts, academics, professionals of research institutions Bohemia Academy of the Czech Republic. The purpose of the "National Strategy for Innovation" is to improve the efficiency of the Czech economy. Research activities and development of innovations identified an important prerequisite for successful economic growth.

The most important issues for the organization and management of the Czech Education and Science solved in the Ministry of Education, Youth and Sport – themain body in the system of central executive authorities to ensure the implementation of the state policy in the sphere of science, science and technology, innovation and intellectual property. Certain features in this area and also perform other ministries: health, environment, agriculture and economy.

For an effective state policy in the field of science operates the Czech Council for Research, Development and Innovation, which is the main advisory body to the Government of the Czech Republic (CR). The Council consists of 17 members – representativesof research institutions, universities, the Academy of Sciences of the Czech Republic. The Council plays a key role in developing strategic directions of research activity in the country, submit proposals on allocation of budget funds for scientific programs and projects approved, together with the Ministry of Finance.

As a result of reforms in the system of Czech science was minimized government interference in scientific work, simplified mechanism of research funding from the state budget, stimulated competition in the field of science and technology, supported by the integration of research activities in universities, strengthened links between universities and Academy of Sciences of the Czech Republic provided support innovative international scientific cooperation. Universities and the Academy of Sciences of the Czech Republic were able to determine priority areas of research.

2.2.3.Basic provisions of innovative activity in higher education and science in the Visegrad Group Countries

SLOVAKIA

In Slovakia the policy-making process is typically a top-down approach with the ministries exerting a large amount of power.

The overall strategy of the development of science and innovations in Slovakia has become a guide for policy makers and administrators at all levels. In addition to universities and research institutes of the Slovak Academy of Sciences, the main initiators and performers of the plan of action is **newly created innovative centers of advanced technologies, centers of advanced research and technology transfer centers, science and technology parks and research centers.**They closely work with small and medium enterprises, and contribute to the creation of new innovative companies that initially supported by the state. The joint and coordinated work of all the links in the chain of innovation, organized by the Action Plan and the overall strategy of innovative development, started to give results.

The development of innovative strategy

One of the main points of the strategy of innovative development is capital for innovation. It means the initiation of innovative activity, support of capital funds with increased risk, as well as a creation of system that would facilitate private investment in MSP.

Next is investing in innovative enterprises. This implies investing in research and development of individual firms, providing technical credits, new investments with a high innovative potential, encouragement of investment, which are important for the economy, investment in tourism products and services that are not only of regional importance.

Another important priority of the strategy is dissemination (diffusion) of innovation. This includes support for cooperative ties with not only regional importance, support a number of innovation institutions in business, who have not only regional importance, support for centers of innovation and intellectual property management.

Political support of cooperation between universities with business in Slovakia is mainly reflected in the declarative strategic documents. One of these documents is a «Long-term plan of educational, research, and other creative activities at universities by 2014». The first priority of the cooperation of universities with business, named in this document, improve the quality of science and education at Slovak universities and noted that modern enterprises will cooperate only with those academic institutions that provide it. Support from the government of this area is based solely on the recommendations and implemented mainly through projects, funded by the European Union.

Thus, for example, the **Technical University of Košice**has close links with local and international industrial partners. Cooperation with business is realized primarily through the activities of many modern laboratories, most of which was created through projects with EU funding. For example, each department of the Faculty of Electrical Engineering and Computer Science has its own teaching and research laboratory, which provides not only the practical part of the training program, but also becomes the first workplace for many students.Many laboratories created through collaboration with major world producers of global IT technology, network equipment and IT services providers: CISCO Telepresence, CISCO IPv6 Lab, Laboratory IBM, T-System. In commercial projects along laboratories are professors, students and representatives of organizations customers. Most of the postgraduate students working on dissertations along with their potential employers. Students are encouraged to pass external examinations for the purpose of professional certification (eg. professional certification in information technology products for use with Cisco Systems).

Development of distance learning (e-learning). Implementing the principle of "lifelong learning" University provides knowledge of specialized computer programs required for employees.

The University is trying to develop new activities associated with the business. Created a **university center of innovation, technology transfer and intellectual property protection UCITT.** University Administration tries to motivate lecturers and scientists to find commercial projects. The University reserves for its own use 15% of return for the use of the brand, risks and guarantees, and the rest is divided among competitors. Thusin the structure of the salary scientific and pedagogical employees component obtained through various projects up to 40%.

HUNGARY

Science-based innovative policy in Hungary is based on the following sources:

- **Cooperation** between users and / or producers. New players join the innovation process – those who create forms of cooperation based on established knowledge, generating new opportunities.
- **Modular constructions,** parts of which can be initiated independently, but together they form a unified innovation system. Complex of technological innovations in a decentralized system is implemented through a new support in coordination and certification.
- **Information and communication technologies,** if they can effectively be used as the only tool for innovation, it is largely contributing of activities transformation.

Sources of knowledge generation and innovations based on the methods described above, listed below (**Table2.3**):

Table 2.3

Sources of knowledge generation and innovations

	1	**2**	**3**	**4**
Sources of innovation	Scientific research	The needs of users and their requests	Modular system	Information and communication technologies as an innovative tool

Important partici-pants and contacts	Created en-terprises at universities	Horizontal communi-ties	Inventors and modu-lardesign-ers	ICT – suppli-ers, managers, employees, stakeholders, customers
Transfer of knowledge in industry	Processes and products that are of direct importance for further development of scientific knowledge	Practical knowledge, that the community can achieve much more	Integrative knowledge. Visible in-formation	ICT – pro-cessed through the system, cod-ified knowl-edge

Knowledge and innovation in the social dimension
Innovations based on science

The organizational model of free movement – a significant feature of the knowledge that has proven its effectiveness. According to this model in the public sector of scientific research industrial sector may be freely used. This knowledge forms a very important transition to private scientific research and innovative activity.

The results of public knowledge increased through scientific research and individual investment declarations; usually it is a common knowledge base for further research that provides more benefits to companies investing, than unfavorable competitive position of equal access to knowledge.

Strengths of the Hungarian innovation system:

- high level of the economy openness;
- high grade of scientific research achievements, significant achievements in physics, mathematics, biology, chemistry, medicine and engineering science;
- science, technology and innovatiму policy supported by an appropriate legal framework;
- institutions and framework conditions developed rapidly andhelping in many innovative relations.

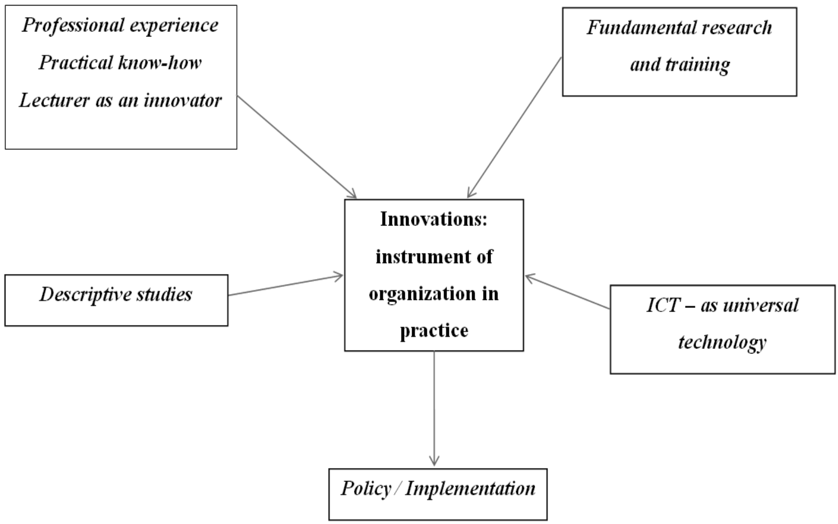

Figure 2.1

<u>The most important task of comprehensive innovative policy:</u>

- Hungary should strengthen the fragmented infrastructure of knowledge generation – research institutions, universities, and coordinate their activities to ensure the recovery and improve their capacity to implement major objectives; contribution to the strategic goals of the national economy that is measurable;
- social and personal responsibility should be considered when making a decision and its preparation;
- should be established institutional systemsto develop and implement long-term innovation strategy for stability that is vertical direction and horizontal coordination.

Innovations in practice

Therefore, in our opinion, can be identify common positive featuresof aforementioned RIS, which experience can be applied in practice, and regions of Ukraine; this is including the following:

- the important role of research institutions and universities in innovative activity;
- creation, involving local authorities, organizations that combine both enterprises engaged in innovative activity and scientific institutions that can serve as a generator of innovations;
- much emphasis on state support of innovative activity of small and medium-sized businesses, in particular through the mechanism of tax incentives;
- the creation of new structures - industrial parks, innovation centers, incubators, etc;
- implementing programs to promote innovation in those industries in which the region has a high competitive potential;
- a close network of relations between actors of innovative activity.

POLAND

Market commercialization of new knowledge in the form of new products or technologies is a complicated process, with great risk. This process requires high and various powers that usually exceed the capabilities of academia and business. However, the association's activities «science-economy» constrained by a number of barriers that make it difficult to work together on commercial projects. In these circumstances formed special entities that act for the purpose of technology transfer from science to economics. **Such entities may be called: the center of technology transfer, technology center, technology agency, incubators of innovation, Technology Park and more.** For this category of institutions with different purposes in many aspects, legal form, structure and so decided to take common definition – centersof innovation, intermediary institutions, technology transfer infrastructure.

Therefore, in practice, centers of innovation and entrepreneurship consider as subjects that implement support programs in the field of innovations and entrepreneurship in the broadest sense of the words.

This activity occurs in the forms of:

- **dissemination of knowledge and skills** by providing consultations and conduct training, collection and dissemination of information, assistance in technology transfer as part of technology transfer centers activity;
- **support** in the creation of new enterprises within scientific organizations and universities that are established by students, graduates, postgraduate students and research workers in so-called pre-incubators and academic entrepreneurship incubators;
- **providing comprehensive services** in a certain place on a particular standard in an environment of academic institutions to support the launch of innovative economic activities (innovative incubators, business incubators, technology centers);
- **create of enterprises concentration places** (clusters) and innovative environment by combining within a particular area for business services and various forms of assistance for technological companies within the technological, scientific and industrial and technological parks.
- **provision of initial financial support** (*seed and start-up*) in the form of para-banks loan and guarantee funds; an important addition to the market in this category are commercially oriented venture capital funds (*venture capital*).

Centers of innovation*are an essential element of every modern innovative system of the country that is building the foundations of the economy, based on knowledge.* They are responsible for building a platform of dialogue and cooperation between the world of science and business, creating conditions for efficient transfer of information, knowledge and technology.**Their activities include:**

- **initiating and organizing cooperation** of all partners, necessary for the effective implementation of the innovative process;

- **definition of the innovative needs** of firms and commercial opportunities within scientific organizations;
- **improving technology transfer mechanisms;**
- **creating the economic development partnership** of various private and public entities;
- implementation of support programs in the regions.

On the basis of the subject activity, missions, goals and nature of non-profit, in Polish conditions to organizations of support could be included the following types of entities:

- organizationally and financially independent subjects of research organizations, active in the commercialization of new technologies, that offer support for the development of the local (regional) economy;

The ability of support system is a function of identifying the needs for development and construction on its base programs that create the possibility of optimal use of scarce resources. This in particular:

- **foundations and associations,** and created by them entities that implement the program of business development and technology transfer;
- **public-private partnerships,** based on the initiative and with the great organizational and financial participation of state and local governments that perform activities aimed at supporting the development are not required to generate profits to determine allocation of latter among shareholders (agencies of local and regional development);
- organizational and financial independent local government entities, aimed at supporting innovativeness and the development of the local economy.

The role of innovative centersin modern economies is growing rapidly. It is connected with a departure from the linear model of innovation process, where were dominated purchase and sale acts of technology solutions. Today, technology transfer is an interactive process in which there are a variety of feedback loops between the transmitter and receiver of information. This is an exceptional form of communication process which includes various forms of dissemination of innovations and technical education.Today, traditional forms of transfer complemented by the following aspects: the creation of small technological firms and support of innovative activities in SMEs; technology consulting and intermediary, informing about new technologies; initiate of support networks, collaboration and cooperation.

Usually initiators of changes, persons, who try to introduce any new solutions to the social and economic life, face various barriers – mental, financial, political and organizational.

One of the obvious effect was the creation of the Association of Polish business incubators and innovation centers, which started information, advocacy, consulting, training activities and lobbying.

Today, after 15 years of experience, occurs slow consolidation of the Polish model of institutional support of innovative activity. The role of innovative centers embodied in the *National Development Plan* and other program documents on economic development.

Innovation centers are a priority tool in realization of Sectoral operational program (*SOP*) – increase competitiveness of the economy.

The development of technology parks and incubators directly recorded in Priority 1, Action 3: «Creation of favorable conditions for enterprise development». As support of the analyzed initiatives we can consider other actions. For example, (1) «Strengthening of organizations that support activities of enterprises» and (4) «Strengthening of cooperation between scientific research and economy sphere». Here, primarily, talking about the development of business support services. Projects can be financed from the following sources: *SOP* «Human Resource Development», Priority 2 – «Development of society based on knowledge»,Action 3 – «Development of modern economy and entrepreneurship personnel»; from «Integrated Operational Programme for Regional

Development» (IOPRD), for example, Priority 1 – «Restructuring and modernization of the infrastructure that serves to strengthen the regions competitiveness», Action 5 – «Infrastructure of Information Society», Priority 2 – «Strengthening of regional economic base and human resources», Action 3 – «Development of the regional economy personnel», Action 4 –»Regional innovative strategies», Priority 3 –»Local Development».

In the second half of 2005 the number of active centers of innovation was 77, while the number of implemented initiatives – 86. Compared to 2004 there was a 60 percent increase in the number of subjects of this type. Thus, high dynamics has several sources:

- development of new centers categories – academic entrepreneurship incubators, most of which began operations in late 2004 – early 2005;
- in the sphare of innovative support began operating Scientific Development Units (*SDU*) and professional associations (Higher technical organization and voivodeship clubs of technology and rationalization);
- increased activity of private higher education institutions;
- realization of projects Priority 1, Action 3 – "Creating favorable conditions for enterprise development" within the Sectoral Operational Programme *"Increase of economic competitiveness".*

Most of the new centers were created as a result of new tasks by entities whose market position has become stable. New institutions are exceptions. A number of analyzed centers operate in the form of projects of limited organizational and technological autonomy. In several cases we faced with a specific situation of centers duplication, for example, in the technology park, developing, operates technological incubator or the academic incubator of entrepreneurship operates in the center of technology transfer.

In recent years an important element to support the development of technology transfer infrastructure was the activity of Polish Agency for Enterprise Development *(PAED)*, namely:

- elaboration of analytical reports on the possibility of implementing, reporting on the impact on environment and business plans for 13 industrial and industrial-technological parks (tasks, implemented in cooperation with the Industrial Development Agency);
- assistance in the creation and management by 23 technology transfer centers, technology parks and incubators.

Table 2.4

No.	**Types of innovative centers in Poland**	**Acting**	**In the process of establishment (evaluation data)**
1	**2**	**3**	**4**
1.	Technology transfer centers	44	40
2.	Technological incubators	7	15
3.	Academic entrepreneurship incubators	18	12
4.	Technology parks (including industrial and scientific-technological parks)	8	19
Total		**77**	**86**

Source: [9]

As a result was completed a number of projects: technological and industrial-technological parks, technology and academic incubators. An important form of activity that integrates environmental support institutions in some voivodeships is the development of regional innovative strategies. In the future, at the regional level, which is coordinated by Marshal departments, is expected to increase the role and mechanisms of support and number of influential people who make decisions.

Polish innovative centers operate in different organizational and legal forms. We often faced with entities of R&D sector (43,2%), here 72% are academic institutions, inter-faculty centers or centers of faculties.

Over the coming years is expected to preserve the dynamics of new centers due to the following prerequisites:

1) written in the Lisbon strategy priorities for the EU countries lead to the fact that the use of Structural Funds are increasingly focused on building the economy, based on knowledge, including the development of institutions and mechanisms for the transfer of knowledge and technology to small and medium-sized enterprises;

2) development of new forms of activity of the university; growth of competition forces them to expand the scope of the traditional functions of higher education institutions (research didactic), including for it activities in the field of entrepreneurship and technology transfer;

3) restructuring of the Polish Academy of Sciences units of research and development.

4) academic institutions search for additional sources of financing, expansion of Patent Office tasks, networks of contact points and career centers;

5) expand the scope of tasks and gradual modification of existing centers of entrepreneurship in technology centers, implementing programs to support innovative and technology transfer to SMEs.

To strengthen existing and create new organizations of entrepreneurship support and development the key importance are activities in the following areas:

1. Creation of programs to support innovativeness, entrepreneurship and SMEs development at the national, regional and district levels, everywhere, where are funds for the most effective institutions (allocated in the competition).

2. Improving management and participation in existing support programs.

3. The development of education for business consultants and technology transfer experts; training and improvement teams in the organization of technology transfer and intellectual property protection: postgraduate training, postgraduate studies,

study tours and training abroad in known higher educational institutions of the USA and Europe (as well as Chinese, Taiwanese and Israeli).

4. Increasing the level of processing skills and program management transfer and technology commercialization.

5. Development of lobbying infrastructure in the regions at the national level and at the European Commission; processing and and information about «history of success».

6. Development of such regional systems of innovation, as cooperation network administration, research institutions, centers of innovation and entrepreneurship.

7. Assistance in preparation of analytical reports on the possibility of performance and preperation of business plans for new centers and ensure their uniform development throughout the country.

8. Development of international contacts and cooperation.

9. Development of the monitoring system of organizations and support programs.

For example, the Industrial Science and Technology Park in Suwalki, energy and aviation clusters in Rzeszów was founded in industrially backward in the recent past regions, but now, despite the critical attitude to them of some research groups in the capital, they actively operate, creating new workplaces and favorable innovative climate.

Successful activities of players in innovative field at the regional level include:

- significant role in locally implementation of the plan of national innovative policies;
- active participation in the region development;
- important role in the implementation of regional innovative strategies;
- collaboration and cooperation of regional technological and industrial clusters;
- participation in joint technological and research projects;
- optimal use of central and local budget for economic development;

- coordinated work of state authorities responsible for the development and implementation of national science and innovative policy (ministries, national agencies, local authorities, etc.);
- participation in the implementation of national development programs;
- participation in the search of scientific studies.

In Poland, in Gdansk Institute for Market Economics was conducted a study of regional innovation systems (RIS). According to it, can be identified the following strengths points:

- activity aimed at the financial (mainly from the Structural Funds) support of innovation;
- availability of financial instruments to support research and development;
- increasing awareness and innovative culture of enterprises, institutions and local authorities;
- growing number of innovation-active enterprises (increased level of spending on research and development and employment in this area);
- growing number of institutions in support of innovations and business support institutions;
- high competitive potential of firms in some (traditional for Poland) industries: food processing, engineering and wood industry;
- increasing the number of goods and services of innovative character;
- high level of activity of the business environment;
- improve access of firms to technology transfer at regional, national and international levels;
- increase the share of exports of highly processed goods;
- implementation of European projects related to innovation development;
- dynamic development of small and medium businesses sector.

Meanwhile, we also need to define some weaknesses of RIS in Poland:

- qualifications of some employees of research institutions is too low in terms of their ability to participate in improving of innovative activity;
- limited opportunities for cooperation with research institutions and other companies; outdated technologies and technical equipment of many companies;
- a limited number of incentives for innovative activity (without significant tax incentives or investment support);
- limited funds of own companies to invest in innovative activity.

CZECH REPUBLIC

At the end of the XX – beginning of XXI century Czech scientific system tried to adapt to the political and economic changes in the country. Today the high level of Czech modern science has achieved thanks to the active support of the state and reform of the scientific system.

Today the Czech government creates conditions for the provision of an effective system of state support for research and development that meets the needs of the economy at the present stage of adaptation to EU standards. This minimizes government interference in scientific work, simplify funding arrangements from the State budget, encourages competition in the field of science and technology, supports the integration of research activities in universities, strengthening links between universities and the Academy of Sciences, as well as supporting international scientific innovative cooperation [43].

The most important issues for the organization and management of the Czech Education and Science solved in the Ministry of Education, Youth and Sport – the main body in the system of central executive authorities to implement the state policy in the sphere of science, science and technology, innovative activities and intellectual property. Certain features in this area also performs other ministries: health care, environment, agriculture and economy.

To conduct effective public policy in the Czech Republic in scientific sphere operates the Council of research, development and innovation, which is the main advisory body to the Government of the Czech Republic (CR). The Council consists of 17 members – representatives of research institutions, universities, the Academy of Sciences of the Czech Republic. The Council plays a key role in developing strategic directions of research activity in the country, submit proposals on allocation of budget funds for scientific programs and projects approved by the Ministry of Finance.

Government of the Czech Republic was defined objectives and priorities of modern scientific and innovation policy. Key issues related to the principles, form of organization and management of R&D, popularization of Czech science regulated by normative and legal documents. Among them should be noted the Programs: «National research policy for 2009-2015», «The main principles of the Czech Republic government activities in the field of science and technology». In these regulation acts clearly defines the role of research work in the Czech Republic, the functions of the state and established the basic principles governing the activities of the government in the field of science and technology. In September 2011 the Czech government approved regulation acts: «International competitiveness strategy in the Czech Republic», «National Strategy for Innovation», prepared with the participation of the Ministry of Industry and Trade, the National Economic Council, as well as experts, academics, professionals of research institutions in the Czech Republic, Academy of the CR. The purpose of the «National Strategy for Innovation» is to improve the efficiency of the Czech economy. R&D and development of innovation identified an important prerequisite for successful economic growth.

In recent years, state allocations for research and development in the Czech Republic are allocated mainly for non-university research centers. Key financial income, aimed at the development of Czech science, divided between the Academy of Sciences of the Czech Republic and the Ministry of Education, Youth and Sports. A small part of the funds from the state budget goes to the Ministry of Industry and Trade, Ministry of Health, Ministry of Agriculture, Ministry of Environment, Ministry of Transport for the financing of targeted industrial applications and research projects that enhance the competitiveness of the Czech economy. Overall, in 2010 financial income on the development of research activities in the Czech Republic amounted to about 1.56% of GDP (49% of the funds allocated by the private sector, 41% – the state, 10% – foreign investors).

During the last years the Czech Republic increasingly focuses on the development of science, but only at the expense of the state budget, science can not fully develop, so funding for research exercised through the introduction of grants. The Czech government, universities and the Academy of Sciences of the Czech Republic set up funds that finance basic research. Some research funded agencies that created by ministries and agencies, large industrial companies interested in scientific research. An important role in the distribution of funds plays Agency for Technology (founded in 2009), which supports programs applied social research projects, experimental development, innovative research and so on.

As a result of reforms in the system of Czech science was minimized government interference in scientific work, simplified mechanism of research funding from the state budget, stimulated competition in the field of science and technology, supported by the integration of research activities in universities, strengthened links between universities and Academy of Sciences of the Czech Republic, provided support to international scientific innovative cooperation. Universities and the Academy of Sciences of the Czech Republic were able to determine priority areas of research.

In the Czech Republic communications between science and industry became very important, introduction of scientific developments into production. In the initial period of reforms was envisaged that the industrial research institutions are transformed into regional technology parks. Research organizations founded the Association of science parks, which was a base for the reorganization of research institutions. For the introduction of technology into production was established the Association of technology transfer and exchange. In political circles, this position was not supported, resulting in 105 research institutions have been privatized and its activities have become less engaged in scientific research [16]. Have been implemented government programs “Park” and “Transfer”, which provided real support to small and medium enterprises. Also, local budgets play an important role in financing of research projects.

The academic sector reoriented to engineering science and applied research. This created an opportunity to establish closer contacts with the management of scientific and technological parks. Scientific and technological parks emerged and in the Academy of Sciences, although they were less productive than established on the basis of industrial enterprises.

Gradually formed links between universities and industrial firms. They acquired the character of research expertise of new technologies and scientific developments that were used in production. However, the Czech universities such practice takes a small percentage and financially the priority is given to education, not research.

<u>Among the most famous universities of the Czech Republic should be noted:</u>

- Charles University;
- T. G. Masaryk University (Brno)
- University of West Bohemia (Pilsen);
- Higher technical school (Brno)
- Higher Mining School - Technical University (Ostrava);
- F. Palacky University (Olomouc)
- Czech Technical University (Prague);
- Mendeleevskaya Agriculture and Forestry University (Brno)
- Czech Agricultural University (Prague).

In total, there more than 35 universitiesin the Czech Republic. At universities are institutions that conduct research and development activities. In particular, the T. G. Masaryk University operate: International Institute of Political Science, Institute of Computer Science, of at the Charles University operate Institute of political science and international relations, Institute of Economics, Institute of Sociology, Institute of Journalism and so on.

According to a study, conducted in 2010 by Spanish research group Scimago, was determined ranking of the Czech Academy of Sciences and Charles University, according to which these institutions occupy an honorable fifth and sixth place among research institutes and universities in Central and Eastern Europe . Overall rating includes 172 research institutes and universities from Eastern Europe and 2833 institutions worldwide. In the world ranking Academy of Sciences of the Czech Republic and Charles University took 97 and 231 place respectively [2].

The basis for the development of modern scientific and technological cooperation between the Czech Republic and Ukraine were laid by signing an agreement between the Government of the Czech Republic and the Cabinet of Ministers of Ukraine on economic, industrial and scientific-technical cooperation, an agreement on cooperation in culture between the Ministry of Culture of Ukraine and the Ministry of Culture of the Czech Republic in 2012-2014's, agreements on cooperation in education and science for 2012-2015 between the Ministry of Education ana Science, Youth and Sports of Ukraine and the Ministry of Education, Youth and Sports of the Czech Republic. Legal basis for scientific and technical cooperation between the Czech Republic and Ukraine is sufficiently broad and covers a wide range of cooperation between the parties in this area. Scientific and technical cooperation between Ukraine and the Czech Republic provides for joint scientific and technological research projects; exchange of scientists, specialists, researchers and experts to implement scientific programs and projects; exchange of scientific and technical information, documentation, and samples and laboratory equipment; organizing and conducting joint scientific conferences, symposia, seminars and exhibitions. In addition, there are a number of direct agreements on cooperation between universities of Ukraine and the Czech Republic.

Cooperation in education also occurs through the exchange of students, postgraduate students and professors of higher educational institutions of both countries.

A characteristic feature of international cooperation of scientific organizations in Czech Republic has been a transition in the form of multilateral cooperation with foreign scientific institutions. Especially intensively began to develop international scientific cooperation with European countries. Thanks to the signed association agreement, the country gained full access to all programs and activities of the European Union in the field of science and technology.

It should be emphasized, that the main factor in the innovative process in the country is industrial development. Thus the priorities are such high-tech industries as automotive and aerospace, information, telecommunication, nano- and biotechnologies. Target research programs carried out by 22 government agencies and departments. Operates the Center for aviation and space research.

A significant role in the development of innovative institutions devoted to the Czech Academy of Sciences and higher education institutions. In institutes and universities created specialized technology centers that provide services to entrepreneurs in the field of technology transfer. These centers and other specialized research organizations interact with industry, creating consortia to work on specific projects.

Also deserves special attention the practice of creating so-called innovative business incubators and scientific and technological parks, which came into widespread use in the country. Programs of innovative incubators provide for entrepreneurial entities a number of financial and other instruments and support services. Programs management carried out by innovation incubators management. In case of scientific and technological parks refers to large projects, providing administrative and laboratory premises to rent for entrepreneurial and state institutions, higher education institutions, as well as small innovative firms. The volume of services is lower than in incubators, but tenants can use benefits of a high concentration of innovative entities in one place. According to the results of international research consulting company «Ernst&Young», now the Czech Republic is among the ten countries, most attractive for investment in the development of scientific and technological parks.

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This report first reviews the current discussion about innovation, looking at its definition and theoretical underpinnings from different angles. It is followed by an analysis of the rationale, goals, instruments and organisational framework of innovation policies in the Visegrad Countries.

The report argues that the Visegrad Countries tend to focus on a narrow understanding of innovation – expressed in the science-push model of innovation, as well as in mainstream economics – as opposed to the broader understanding promoted by the evolutionary approach.

The latter approach would provide more appropriate guidelines for developing innovation systems, improving performance and achieving

more pronounced and favourable impacts on socio-economic development in general.

74. Tools for innovative support of SMEs: the experience of Poland and the European Union [Electronic resource]. – Access mode: http://www.agroin.org/statti/polsha.pdf

The manual highlights the main aspects of a regional approach to innovation development and building regional innovation strategies. Posted practical example of this strategy, described the role of innovative centers and development of innovativeness on the basis of some Polish institutions. Contains the description of positive examples and practices, applied in the European Union to raise the level of innovativeness in the regions, submitted contact of institutions that in some regions implementing the described programs. The form and amount of presented information contributes to deepening knowledge of the mentioned topic, increase the intensity of Ukrainian-Polish cooperation and preparation of joint activities – both in the field of regional innovation strategies, and in other areas.

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Part 3

INNOVATIONS IN EDUCATION AND SCIENCE OF THE CERTAIN COUNTRIES OF EUROPE, ASIA AND AMERICA*

3.1. Monitoring of the source base of innovative activity in certain countries of Europe, Asia and America

EUROPE

Republic of Austria

In 2002, in the Austrian Republic was adopted the Law on Universities, which has created legal preconditions and removed obstacles to attracting students and staff of higher scientific institutions for execution of practical projects in the area of innovation. The leading role in this process was played by Christian Doppler Society, which coordinated the work on the establishment of applied research laboratories in educational institutions based on requests and orders of the manufacturing sector of the economy of Austria.

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* In preparation of this Part were used materials of the Edition: Вища освіта України і Болонський процес: навчальний посібник / за редакцією В.Г. Кременя. Авторський колектив: М.Ф. Степко, Я.Я. Болюбаш, В.Д. Шинкарук, В.В. Грубінко, І.І. Бабин. – Тернопіль: Навчальна книга - Богдан, 2004. – 384 с.

In particular, on the basis of the aforementioned innovation funds, there was created the Austrian Council for Research and Technology Development, as well as the National Foundation for Research, Technology and Development.

In 2002, the Council published a list of the main objectives in the sphere of innovation policy for the next decade to meet the needs of domestic industrial and research sectors, as well as pan-European innovation policy as part of the Bologna process, in particular:

- strengthening communication and cooperation links between the production and research sphere
- strengthening the innovation component in the activities of small and medium-sized enterprises
- development of a clear strategy for implementation of the national priorities of the Austrian Republic taking into account development of pan-European Research Area, etc.

Kingdom of Belgium

In the context of dynamization and globalization of the world economic processes, as well as increased international competition, innovation and research activity has become an important subject of political debate and a priority for strengthening the competitiveness of Belgium.

Belgian or foreign enterprises registered in Belgium which invest in the research sector, are engaged in innovative activities and develop innovative environmentally friendly technologies, can receive special tax credits.

Belgium has adopted <u>seven-step framework</u> for the development of scientific and technological research, which aims to put into practice the obtained results through the creation of new products or services. Businesses and research institutions, as well as universities, and chambers of commerce can become participants of the programme. The

program consists of several sub-programs, including the following:

- "Cooperation" (32360000 Euro), the main goal of which is to promote international co-operation between industry and research institutions (universities) in the following areas: health, agriculture and biotechnology, IT and nanotechnology, energy, environment, and others.
- Ideas" (7.46 million. Euro) - Aims to support European research groups that carry out scientific research in many fields.
- "Personnel" (4.728 million Euro) - supporting mobility and career development of research scientists, particularly through the implementation of the program "Marie Curie".
- "Potential" (4.217 million Euro) - supports scientific institutions and promotes the creation of necessary infrastructure in all scientific and technological fields.

Such vigorous activities of the Belgian government to support research and development suggests that the country's leadership strongly supports innovation, which has now become the driving force of economic development, in order to enhance the competitiveness of domestic enterprises.

United Kingdom of Great Britain and Northern Ireland

In recent years, the country's leadership has outlined steps to improve the system of state incentives for research and development activities, including increased budgetary allocations for research and its application in practice (up to £6300000000 until 2010.) The increase in total government expenditure and the private sector on research and development is up to £39 000000000, or up to 2.5% of GDP in 2014.

Additional funds were provided to support research and development activities in the field of production technologies, energy, lightweight construction materials, plastic electronics, information technology applications for business, biomedical materials and tissues. The development and promotion of high-tech environmental services in the global market is considered a priority.

Important features of this form of innovation activity are the leading role in determining business objectives, focus on the creation of innovative commercial products, facilitation of bureaucratic procedures, diversification of funding sources. Work has begun on the formation of two national technology platforms that will be the basis for coordinating the work of government departments, universities, industry and financial institutions in the development of "intelligent transport" and systems for the protection of information infrastructure.

Historical and legal and institutional framework

Finance Report of 2004, 'Global economic challenges in the long term and opportunities for the United Kingdom', as well as the joint program for the 10-year period of the Ministry of Finance, Ministry of Trade and Industry and the Department for Children, Schools and Families, called 'Science and Innovation Investment Framework 2004 - 2014' present the basic principles and strategy of state support for the development of high technologies at the present stage. Its main objective is the effective support of R & D (Research and Development) in the field of science and high technology.

According to the chosen strategy for this period, the main activities of state policy in promoting the development of science, technology and innovation include:

- Increase of private investments in research and development and business involvement in research activities in the UK. In this respect a key mechanism of the state strategy is to provide tax credits to conduct these works, as well as some government projects involving private investment;
- Investments in world class research, which is performed in the UK's largest research centers, as well as financial and technical support of leading universities and government laboratories. World-class research is the most im-

portant for many kinds of business activities, which are often dependent on their results;

- Scientific data should be used as much as possible in business to increase general well-being. The state supports the use of results of scientific research in entrepreneurial activity, for example, through the Innovation Fund for Higher Education (Higher Education Innovation Fund), the funding of which has been increased by 110 million pounds in the FY 2007-2008;
- **Sustainable provision of scientific sector with scientists, engineers and technologists. Improving the quality of the professional level of specialists working in the field of science, and improving professional skills of science teachers and lecturers in every school, college and university; increasing the number of university students and high school and college students, choosing specialties related to research activities, and increase in highly qualified students who intend to build a career in R&D;**
- **Increase in state aid to science. The government has committed itself to implement a series of measures aimed at increasing public awareness and understanding of the importance of the scientific base, emphasizing the need to address certain regulatory and ethical issues at different stages of development of new technologies, as well as the need to implement specific steps for successful completion of these stages.**

Strategy for implementation of public policies is based upon the following mechanisms and elements:

- Cooperation and dialogue between industry and academia. In this regard the government directly finances the research partnership between British industrialists and basic science;
- Development of R&D in the regions, including by means of territorial development agencies

- Direct government R&D funding in the form of subsidies and grants.

A key mechanism of state support for science and high technology in the UK from a financial point of view is the use of tax incentives in the field of innovation.

According to British financial experts, there is a real evidence that the tax incentives can have a positive effect on investment in research and development. Studies have shown that they can increase R & D expenses in the amount at least equal to the tax refund.

Bodies of executive power authorized in the field of R&D

Executive body authorized to implement the state policy of stimulating research and development, is the Department for Business, Enterprise and Regulatory Reform, DBERR.

HM Revenue and Customs, (HMRC) carries out realization of tax benefits.

In this regard, DBERR and HMRC adopt important documentation, regulating the order and the procedure for organizations to appeal for obtaining tax benefits, and provide comments on the application of certain provisions of the legislation in this area.

Today there are two schemes for the provision of tax incentives for R&D - for small / medium-sized and large companies. The main differences of the schemes are presented below.

Scheme for small and medium-sized companies	Scheme for large companies
150% rate of tax deductions	125% rate of tax deductions
For every £ 100 of R & D expenditures is provided £ 24 compensation	Not provided
The company can claim tax deductions for expenses related to research and development, including under contract	The company can claim tax deductions for expenses related to research and development only if it carries out those activities on their own or under contract with universities, nonprofit organizations and laboratories

The company can not claim tax creditsfor contributions to independent research	The company can claim tax credits for investments in independent research
The amount of tax deductions may be reduced if the company's activities in the field of research and development are subsidized, or a grant for R & D is received	Reduction of allocations when using grants or subsidies are not provided
One of the prerequisites for a tax refund for a company is the mandatory intellectual property rights for the R & D results	The company is not required to have intellectual property rights for the results of research and development

It should be noted that in the framework of implementation of the state policy in the sphere of science, companies involved in research activities may be awarded grants to carry out research work.

The institutions directly involved in innovation activities

a) <u>Science parks.</u>

One of the key institutions in the field of research and innovation in the UK is science parks. To date, there are over 100 science parks, which contain about 3,000 companies (including 450 foreign), the number of employees of which is 68,000 people. Science parks occupy an area of about 1500000 square meters. They and are designed to support high-tech business in such priority sectors of the national economy (defined by the government) as biomedicine, pharmaceuticals, information technology, energy saving technologies and technologies for using alternative energy sources (aiming to create the economy based on the use of energy produced not from carbohydrate energy sources).

Science parks provide assistance in the implementation of the project via relations with universities and other academic resources.

<u>b) ScienceParkAssociation.</u>

UK Science Park Association is a key organization that plans activities and further development of science parks in the country.

Science parks may belong to organizations with different types of ownership. These may be universities, local authorities or private consulting companies. No tax benefits for companies that operate within the science parks are provided.

c) Technology parks.

The main UK government agency that coordinates activities and development of technology parks is the UK Trade & Investment. The said institution provides organizational and information support through its headquarters located in London and Glasgow, as well as representative offices in nine English regions. Agency focuses on the organization of cooperation with business through regional institutions. Direct development of infrastructure and network management of technology parks carries out UK Business Incubation, which operates through a network of representative offices of the UK Trade & Investment Office.

UK technology parks have a positive effect on social and economic development of the country and its export potential, namely:

1) Stimulate regional development, provide employment for the local population and, as a result, contribute to the revenue part of local budgets;

2) Promote diversification of production, thereby improving the competitiveness of the economy

3) Association of small businesses in the common clusters increases their productivity through synergy

4) Supporting enterprise groups by the state is more effective than supporting individual enterprises.

d) Business incubators.

In the UK, there is a network of more than 325 business incubators, which provide companies with the following services:

- The establishment of the company and its transfer for a lease on flexible terms
- Supervision by experienced professionals
- Delivering training and seminars
- Access to financial resources

- Quick interaction with other companies that are also located in the network of technology parks

- The provision of such paid services as secretarial services, accounting, video conferencing, etc.

In addition, business incubators practice provision of business services to companies located outside the (territory) of the incubator.

Companies that are located directly in the territory of the business incubator can enjoy the great advantages, namely: special links with universities and research centres, and access to specialized counselling centres (in the territory of the business park).

In addition to the ministries and departments of Great Britain, Department of the Ministry of Culture, Media and Sport also deals with the implementation of innovative products under the program entitled "Supporting creative industries."

Areas that enable creation of new jobs on the basis of intellectual property rights also belong to the creative industries (the Ministry of Business, Enterprise and Regulatory Reform is working in collaboration on finding new export opportunities for the creative arts).

Kingdom of Denmark

Recently, developed countries, including Denmark, recognizing the role of new technologies and innovation as the main precondition for further economic development and prosperity, have been actively carrying out innovation policy, designed to create the best framework conditions for innovation.

The main objectives of the Ministry of Education of Denmark is to promote the creation of society based on knowledge, in which value creation is based on effective interaction between educational institutions, society and industry; as well as ensuring the exchange of knowledge and scientific development between academia and enterprises, improvement of cooperation and the rapid exchange of information and achievements between the public and private research, both within the country and abroad. The Ministry is also responsible for the development and implementation of tools to encourage innovation in public institutions and industrial enterprises.

The main document on implementation of the policy of Denmark in the field of innovation is the national program of innovative activities «Innovation Denmark 2007-2010», which was adopted in 2007. The main emphasis is on improving education, promotion of knowledge, research, inventions and innovations.

Based on the above-mentioned laws and frameworks, in Denmark has been implemented an innovative system consisting of the following elements: the government, the ministries, the Council for Technology and Innovation (under the Ministry of Science, Technology and Innovation) and the research councils that form the conceptual basis for the development of innovation in Denmark and are responsible for their implementation. Research and innovations also carry out universities, sector research institutions, other research institutions (museums, archives, etc.), and certified institutions of technology services, science parks and innovation incubators.

Science parks

An important component of the innovation system of Denmark is "science parks." Association of Science Parks of Denmark defines the science park as an initiative, formally linked with one or more universities or other higher educational institutions. They are created to support the formation and growth of companies based on knowledge, as well as to provide premises for such services. They have a governing unit, which is involved in the promotion of knowledge transfer between research institutions as well as employing organizations. At present, Denmark has seven science parks, which are private organizations and have close relationship with universities. In some cases, universities act as shareholders or full-fledged owners of science parks.

In the structure of state support of innovation activities, in particular in the Ministry of Foreign Affairs of Denmark, acts **The Trade and Export Council**, which includes the Department of innovation that carries out activities of the innovation centres of Denmark abroad. It was created in 2006 to promote dissemination and exchange of innovative technologies in accordance with the government's globalization strategy, and was a joint initiative of the Danish Ministry of Science, Technology and Innovation, and the Ministry of Foreign Affairs of Denmark.

Innovation centers.

Thus, currently Danish innovation centres are open in the United States, China and Germany. The main objective of the innovation centres is to promote the access of Danish research institutions and companies to foreign networks, knowledge, technology, capital and markets. In addition, innovation centres contribute to the coordination of research and innovation initiatives, thereby strengthening the credibility and effectiveness of research and business communities abroad. These structures are the link in the development of innovation between academia and private business. They provide effective support for enterprises and carry out appropriate consultations.

Thus, innovation centres act as a communication link between Denmark and other countries in promoting innovation, strengthening contacts between Danish and foreign research institutions and businesses. Innovation centres are located in dynamic regions where well-known universities and world leading companies collaborate in a unique research and innovation environment. Coordination of activities of innovation centres rely on Attaché for Science and Technology, appointed by the Ministry of Science, Technology and Innovation in agreement with the Ministry of Foreign Affairs of Denmark.. Innovation centres are financed from the budget of ministries, averaging about 10 million DKK per year. The issue of efficiency of innovation centres' activities abroad, and innovation in general is widely discussed in government circles of Denmark. The current system where performance is evaluated by evaluating the profit derived by Innovation Centre and other public services from engaging Danish enterprises as well as other subjective, according to the Ministry of Foreign Affairs of Denmark, factors, cannot fully reflect the efficiency of use of public funds allocated to innovative activities.

Spain

Among the priorities of the current government of Spain is state support, including substantial financial assistance, the development of science and new technologies. To this end, in April 2008, in Spain was created a new Ministry of Science and Innovation, www.micinn.es, (before issues of science belonged to the competence of the Ministry of Education and Science), which is responsible for the development and implementation of government policy in the field of research, technological development and innovation (I + D + I, in Spanish investigacin + desarrollo + innovacin, which means the research + development + innovation), the main objective of which is to bring Spain to a leading position in the world in these areas.

A nationwide system of I + D have "dual nature". Its key members are the universities and public research institutions. Among the research centres of Spain could be mentioned The Spanish Higher Council for Scientific Research (CSIC, its activities have multifaceted and multidisciplinary character, though largely dominated by basic research).

In Spain, there are 48 public universities, which, along with the functions of higher education institutions, also serve as research centres (they employ 86.9 thousand people, finance 4% of the I + D sectoral activity and account for 29.5% of government spending on I + D). These university centres make 70% of the Spanish scientific production for international use.

CSIC has 115 specialized research centres, employing 3175 researchers, and accounts for 20% of Spanish publications in international journals, although it generates only 2.4% of the patents of Spain.

Spanish research system includes various organizations and institutions, which are intermediaries between I + D industry and industrial sector; and their objective is to promote new developments in manufacturing (including research results transfer offices, science and technology parks, technology centres).

For the implementation of these principles, strategic objectives are designed to:

- Promote highly competitive business;
- Develop integrated policies of Science, Technology and Innovation;
- Move forward in the international dimension as the basis for a qualitative development of the system;
- Achieve favourable environment for investment in the I + D + I industry;
- Contribute to the development of scientific and technological culture in society.

Italy

Innovative system (IS) in Italy is a complex of various institutions (public and private) that individually and collectively contribute to the development and dissemination of new technologies.

The first innovative structures, parks and science and technology parks (STPs) were set up in Italy in the early 70s to coordinate and intensify research in the interests of maintaining the overall scientific and technical development, the introduction of new technologies in production, acceleration of development in depressed and economically underdeveloped regions of the country, especially in southern Italy.

As of 2008, according to the Association of scientific and technological parks in Italy, the country has 31 STP, consisting of about 600 high-tech enterprises, 140 of which are incubated, 14 business incubators, specialized in supporting the creation and development of new businesses, and 150 research centres.

As part of the STP, the development process of innovative projects addresses issues of supply of the domestic commodity market, increasing the volume of production of competitive high-tech products, and increases the number of jobs. **About 2,500 of Italian companies use the services of existing scientific and technological parks**, where the number of employed only in high-tech production is about 6,300 people.

As a rule, the legal form of registration of STP in Italy is a consortium of companies (organizations), which may include research institutes, universities, local (regional) authorities, individual companies, and the like.

According to the Association of scientific-technological parks in Italy, among incentive mechanisms used for the purpose of creating and developing science and technology parks, the enterprises of the STP have the following advantages:

- Exemption from the registration tax for new companies created as part of STP;
- Exemption from payment of income tax in the first two years of activity and payment of income tax at a reduced rate in the coming years for companies already operating as part of STP;
- Exemption from land tax and property tax.

One of the largest STP in Italy is a scientific and technological park AREA Science Park, which is located near the city Trieste.

STP AREA Science Park is located in an area of 55 hectares, has 1,400 employees working in 60 separate companies-participants of the consortium, which are typologically divided into the following:

- National and international research centers and educational institutions, regional authorities, in particular the Administration of the Autonomous Region of Italy Friuli-Venezia Giulia, University of Trieste, University of Udine, the National Council of Italy for Scientific Research (the analog of the NAS of Ukraine), International Centre for Research in the field of genetic engineering and biotechnology, synchrotron ELETTRA, complex of laboratories and the like;

- Laboratories and service centers of leading international companies in the field of research and development (R&D);
- Selected small and medium-sized high-tech research and development companies and enterprises.

Thus the main motivating factor for participation in the consortium of the Technology Park AREA Science Park for all the above categories of participants is increase of efficiency and the corresponding increase in competitiveness of research, which is achieved by:

- Convergence of interrelated fundamental developments and their practical application;
- Using a common infrastructure, research and laboratory facilities, information and STP computer networks, data banks and the like by the members of STP;
- Obtaining of a centralized patent support, financial, banking and consulting services, etc.;
- The organization of training and retraining of personnel in the form of conferences, seminars, courses etc.;
- Assistance in obtaining financing for R&D works in accordance with the existing regional, national and European programs.

STP AREA Science Park is distinguished by a wide range of studies that find their application in the chemical and pharmaceutical industry, automotive industry, textile industry, environmental protection, space exploration and many other fields of science, technology and industry.

Among other things, STP AREA Science Park is part of a European network of exchange of technologies, Innovation Relay Centre Network - IRENE, founded by the decision of the European Commission in 1995. IRENE network brings together 70 European STP, which employs about 65,000 enterprises, research centres and other organizations of R & D. Since its founding, within the network IRENE was carried out more than 1,000 transfers of technology, 5000 transfer transactions were being processed and finalized.

Kingdom of the Netherlands

One of the important initiatives of the Government of the Netherlands is the formation and implementation of innovation policy, mainly executed by the Ministry of Economy and Ministry of Education, Culture and Science.

The Ministry of Education, Culture and Science coordinates and is responsible for science policy.

In 2008, it established a new inter-ministerial program “Knowledge and Innovation” in order to coordinate and harmonize the policies of all ministries and agencies concerned in this area. Thus, the government identifies its priorities, which then determine the scope of scientific interests of all ministries. The basis of the program “Knowledge and Innovation” is a long-term strategy «Towards an agenda for sustainable growth in productivity», according to which future investments should be directed towards new knowledge and innovation.

In the public sector, 13 universities and many research laboratories / institutes carry out research, which should be divided into the following groups:

- Laboratories / institutions at the University within the competence of The Netherlands Organisation for Scientific Research (NWO) and Royal Netherlands Academy of Arts and Sciences (KNAW);
- Laboratories / institutions subordinated to the Netherlands Organization for Applied Scientific Research (TNO);
- Powerful technological institutions with independent status;
- Laboratories / institutions within ministries;
- Agricultural laboratories / institutes;

- Other laboratories / institutions, including the centers of social studies, health, development cooperation.

Research, carried out in the above institutions should be divided into:

- Fundamental research aimed at obtaining new knowledge;
- Strategic research, i.e. fundamental research in the areas identified as areas of strategic interests of government and society, the results of which are brought to the phase of practical use;
- Applied research, the results of which are also brought to the stage of practical use;
- Research, the results of which are directly related to the direct implementation in the industry.

Compared to the more general and academic nature of university research, activities of TNO have a practical nature, aimed at solving specific problems or social problems. **TNO is working closely with the Technological Universities of the Netherlands.** Cooperation with other scientific organizations may have different forms. For example, 51 TNO employees are currently engaged in teaching activities; under the auspices of TNO in universities are created joint knowledge centres, of which there are now more than 130.

During the development of innovative strategies in the Netherlands was used cluster approach. **The entire economy of the country was divided into six "mega-clusters": Mechanical engineering and instrument-making industry, chemical industry, energy, agriculture, construction, media, health care, business service industries, non-profit servicing industry, and transport. Assessment of "flows of knowledge" between clusters enabled identification of the characteristics of innovation processes.**

Support of innovation activities is carried out through a centralized network of innovation centres, funded by the government. Activities of this network, which have a developed information exchange system, are focused on the assistance, primarily of "consumers slowly perceiving technology."

These centres play a leading role in the regional initiatives.

In general, the number of regional counselling centres is 18 units, which provide and implement technological knowledge in small and medium-sized enterprises (SMEs) through short-term and practical advice. Each SME is entitled to receive a two-day consultation free of charge. The following consultations are paid, but two days are usually enough for customers. The centres were established in 1988 on the initiative of the Ministry of Economy, borrowed from Denmark during the privatization of institutions founded and owned by the state since 1910.

Innovation centres operate independently, and receive funding from the Ministry of Economy through a central agency, which does not affect the content of their activities.

According to the Dutch side, the main form of investment in research and innovation activities in the Netherlands is technology parks. They serve as the basis for all organizational innovation processes, play an important role in the transfer of high technology from the field of basic research into the industry and promote the commercialization of science, positive structural changes in the economy, and increased products competitiveness in the world market. Technology parks can vary greatly in size, structure, and scope of services, the degree of research intensity, structure of participants.

The efficiency of technology parks is largely conditioned by the close ties with scientific, educational and research institutions. Technology parks in the Netherlands, as a rule, operate directly next to the large university centres.

University students have the opportunity to work on projects of other research institutions, firms and companies. Dutch companies use a large number of students' ideas and elaborations through the research centres and institutes. The main idea is that enterprises or research companies, which operate in the

Technology Park, involve staff and students who, in turn, have an opportunity of practical application of their research results, and provide a variety of consulting services to businesses.

Ministry of Education, Culture and Science is the main source of funding for scientific research in the field of high technology, which directly finances research in universities of the country. The Ministry of Economy finances research to stimulate new areas of science and technology that have or may have an impact on the economy of the country.

The Federal Republic of Germany

Germany focuses on fulfilment of the objectives of the Lisbon EU summit to ensure the growth of national and European economies by compliance with the high innovation dynamics and advance to the level of progressive world technologies. Only in this way, according to German experts, the country can successfully meet the challenges that globalization brings, to achieve a successful transition to the knowledge economy and society, while retaining the leading position in the world in economic, scientific, technological and social spheres.

By amount of expenses on research and experimental development (R&D), which make up 2.5% of GDP, Germany takes up one of the leading positions in the world. Particularly in 2005-07, the total expenditure on R&D (state, federal provinces and the private business sector) increased by 10.4% - from 55.7 to 61.5 billion Euros. The expenditures of the federal budget for research and development alone have increased by 3 billion Euros (up to 12 billion Euros in 2009). A significant increase in spending to support innovation, research and education is provided in the framework of two sets of policies to maintain the economic situation, which the German government adopted in November 2008 and January 2009, to counter the global financial and economic crisis.

An important step towards improving the regulatory and legal support, organization and functioning of the national innovation system was the adoption by the government in August 2006 the Development Strategy for Germany in the sphere of high technologies, which defines the priorities, and for the first time comprehensively covers all measures to promote innovation and technological development of the country for the period of the present government coalition of the CDU / CSU and SPD (up to 2009).

The Strategy identifies 17 priority areas of innovation and technological development of the country that meet pre-eminent national interests and have a significant scientific and economic potential. In particular, we are talking about research and development in energy sector (especially energy efficiency, renewable energy), environmental protection, health, safety, enhancing mobility (automotive, shipbuilding, aircraft construction), biotechnology and nanotechnology, new materials for the production and the like. For each of the priority areas has been prepared schedule of measures to improve the framework conditions for activities and provide the necessary financial support from the state.

The Kingdom of Norway

The main state institution, which is designed to support the innovation activities in Norway, is the Research Council of Norway (www.forskningsradet.no).

Organizations, directly involved in the innovation activities in Norway are:

a) Private companies (approx. 50% of all innovation activities in the country account for research within a small number of large industrial companies. At the same time, the share of service companies that carry out their innovative activities is growing. State structures of Norway - The Research Council of Norway, «SIVA» and «Innovation Norway» contribute to attracting small and medium businesses to innovative activity)

b) Higher education institutions (Norway has 7 universities, 6 specialized institutions, 25 university colleges, which provide 25% of innovation activities in the country. As a rule, research is financed from the own budget of state education institutions, grants, the Research Council of Norway and contracts from industrial companies, public sector and private foundations)

c) Independent scientific organizations (in Norway, there are more than 200 independent private institutions, the activities of 70 of which is dedicated exclusively to scientific research. These institutions are not part of the higher state institutions or the industrial sector. Such institutions account for 25% of innovative activities in the country.

These institutions include the individual public research institutions, government agencies, museums, libraries, health care facilities and the like. Most of these institutions receive funding from the Ministry of Education and Research).

Mechanisms to promote innovation in Norway are:

a) Provision of state targeted grants by the Research Council of Norway (each year for this purpose is allocated about 600 million US dollars, of which 48% is directed to the support of innovation in higher education institutions of Norway, 46% to independent scientific institutions, 6% to private companies)

b) The introduction of indirect schemes to support innovation activities by private companies of Norway «SkatteFUNN», according to which private companies can receive up to 20% reimbursement of the amount of taxes paid (so-called "tax credit"), provided they are used for innovation activities. At that, innovative projects should be agreed in advance with the Research Council of Norway

c) Support for business incubators and science parks (Industrial Development Corporation of Norway «SIVA» is responsible for activities of 22 business incubators, 18 science parks, 8 research parks, etc.).

At the same time, "the overall level of innovation" - an indicator that is used to assess the innovation component of the economies of the EU - puts Norway at the lower level than the average in the EU (despite the fact that the average level of the EU countries is much lower than the US or Japan).

Thus, we are talking about so-called “Mystery of Norway”; - a situation in which Norway allocates a smaller percentage of funds for innovation, and at the same continues to maintain high economic indicators of qualitative growth.

Republic of Finland

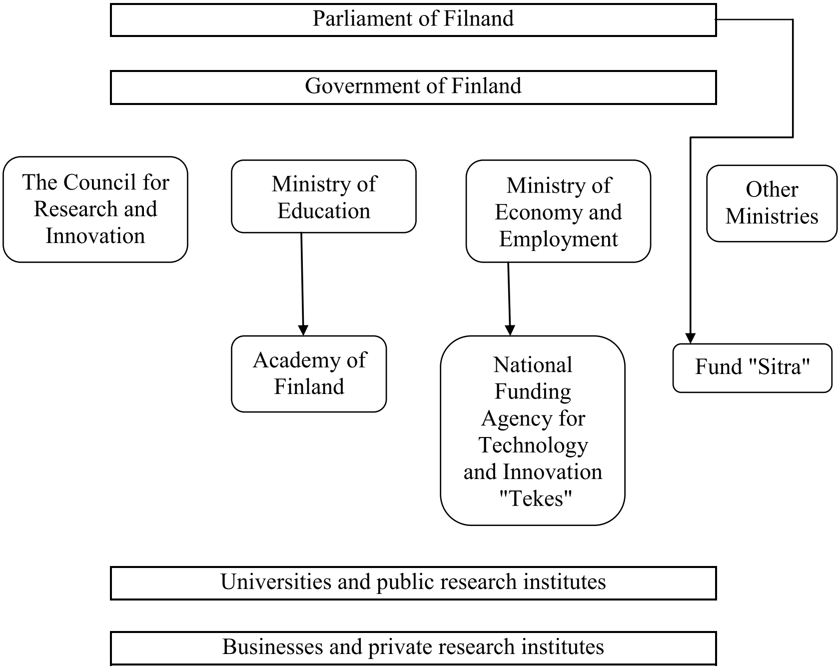
Finland is the most high tech country and its national innovation model is recognized as one of the most efficient in the world. In the two decades, the Finnish economy has been reoriented from the production of raw materials to the high technology manufacturing.

Today Finland is one of the recognized leaders in innovation. Thus, over the past few years, it is in the top ten countries with the best levels of competitiveness of the economy. According to the rating of the «Global Competitiveness Report» for 2008-2009, Finland ranked sixth out of 134 countries. Rating developers took into consideration the overall state of the economy, the concentration of high-tech industries, as well as investment in R & D and education.

Finland became the first country that has adopted the concept of national innovation system as a basic element of policy in the field of science and technology (Fig. 3.1).In terms of investment in research, Finland is one of the leading countries of the world. Funding for university research (basic share of basic research in the country and a part of Applied Sciences) takes place via the Academy of Finland - central scientific administrative body, controlled by the Ministry of Education.

Thus, it can be noted that in Finland is created a strong and effective system of innovation development based on the coordinated activities of the government sector and the business community, formation of the competitive education and university in a developed European educational and scientific space, education of student of a qualitatively new type.

Organizations making decisions and carrying out research and scientific activities



The Swiss Confederation

1. Support for innovation activities in Switzerland takes place in the following directions:

- Support for new businesses and entrepreneurship.
- Research and development.
- The transfer of technology. Particular attention is given to nanotechnology, engineering, chip development, agriculture and biochemistry.

2. The authority responsible for innovation policy in Switzerland is the State Secretariat for Education, Research and Innovation, which is part of the Federal Department (Ministry) of

economy. The Secretariat may delegate its powers to other state agencies and universities.

3. Mechanism for promoting innovation is as follows. Party interested in the project development, passes project documentation to the State Secretariat for Education, Research and Innovation. Depending on the type of application, in case of a decision to support the project, it may be decided to delegate it to a university or other research institution. At all stages of the project, its implementation is monitored by the Secretariat.

Issues of innovation activities are regulated by the federal law “On measures to overcome the crisis and create more jobs” from 09.30.1954, and the decision of the Federal Council “On the promotion of technology development and innovation” from 17.12.1982.

4. The state allocates funds to support innovation. For example, for the period 2008-2011, it was planned to allocate 532 million Swiss francs (483 million USD).

5. The success of the project, which received state support, is the main criterion for assessment of the Secretariat. For projects to support enterprises, the main criterion is the return of the allocated funds, and successful business. For other projects, it is the achievement of the results outlined in the project documentation. According to preliminary calculations, the current level of success of the projects is 87%, which is very high.

Sweden

Swedish innovation system consists of three main areas: the national innovation system, sectoral innovation systems, regional innovation systems.

This structure is a Swedish Agency for Innovation Systems Development (SwedishAgencyforInnovationSystems) — VINNOVA.

VINNOVA has several programs being implemented in the three areas mentioned above:

- **<u>National programs</u>** — provide support for researchers at the stage of program implementation on a commercial basis, and responsibility centers, developing links between academic research and industrial design and construction centers.
- **<u>Regional programs</u>** — VINNOVAXT. Provide Regional Growth through the Dynamic Innovative Sytems.
- **<u>Sectoral Innovation System</u>**, which is supported by the Agency in such areas as information and communications technology, biotechnology, modern and advanced technological processes, developments in the field of materials science, transport and durability.
- **<u>Development of strategies</u>** in implementation of innovations is the prerogative of the Swedish government, particularly at the present stage; it is the responsibility of the Ministry of Industry, Energy and Communications, the Ministry of Education and Research, the Ministry of Culture of Sweden. The Ministry of Health and Social Protection, Ministry of Environment, Ministry of Defence and the Ministry of Finance, which is responsible for budget expenditures for the development of innovation activities, make a great contribution to the development of research and innovation.

In 2004, the Government of Sweden presented a strategy for the development of innovative activity "Innovative Sweden". **<u>The basis of the innovation policy is four main areas:</u>**

- The development of knowledge as a platform for innovation.
- Creation and support of innovative business- formations and business structures.
- Increasing state contributions to the development of innovation.
- Stimulating the development of innovative entrepreneurship in the population.

An important role in the innovation system of Sweden belongs to research councils. They are not directly involved

in innovation, but provide support for research, which is inherently innovative.

The Swedish government in 2001 introduced a new system of organization of research work. The aim of the new organizational structure of the research work is:

- Promotion of intensive research in priority areas of science;
- Greater control over implementation of research;
- Support of inter-sectoral and Interscience research projects;
- Better dissemination of information on research projects and achievements.

To support the development of research and innovation activities, there have been specifically established two research councils. It is the Swedish Research Council for Working Life and Social Sciences - FAS, in the field of social sciences, and the Swedish Research Council for environment, Agricultural Sciences and Spatial Planning - FORMAS, in the field of the environment. These two research councils engage in the promotion and financing of applied research projects in the aforementioned areas.

Most innovation and research programs in Sweden are carried out in research laboratories of universities, colleges and private research laboratories of large manufacturing companies. Some innovative programs in Sweden are initiated directly by the state to bring together business and research, and thus funded by the state.

Business plays a key role in funding innovative research, spending on them around 3.32% of GDP of Sweden. Swedish businesses participate in the development of innovative activity through the "industrial research institutes." Research sector of private companies is mainly concentrated in the 20 largest manufacturing companies, which control 2/3 of the productive capacity of Sweden.

General funding of research and innovation activities in Sweden is 4% of annual GDP (public and private funding). Annual funding of research and innovation in Sweden is the highest among OECD countries and represents approximately 900 billion SEK (137 billion USD).

The Republic of Lithuania

In the Republic of Lithuania, a number of laws and regulations regulate innovative activity. Particular attention is given to this issue in the long-term economic development strategy of Lithuania in government programs, documents on the development of the country after joining the EU.

In order to support and encourage the innovation process, the Government of the Republic of Lithuania approved the Programme of innovation in business, decree number 911 of July 5, 2003 (updated version - June 2008).

The objective of this program is to increase the competitiveness of Lithuanian industry and business, to create favourable conditions for the development of existing enterprises, establishment of new modern enterprises, the use of Lithuanian and international scientific, technical and technological capacity.

The program is implemented through budgetary allocations, the Fund of science and education, EU structural funds, and other programs and funds.

This program has been prepared taking into account the provisions of the Communication from the Commission from 11th of March 2003, “Innovation policy: updating the Union’s approach in the context of the Lisbon strategy”.

Ministry of Economy and Ministry of Science and Education of Lithuania coordinates and monitors the implementation of this program. Results of performance evaluates Scientific and Technological commission established in accordance with the decision of the Government of the Republic of Lithuania from October 1, 2002 №1539 “On establishment of science and technology committee and Approval of the Provisions on it”.

In the long-term development strategy of Lithuania (approved by the Government of the Republic of Lithuania, № IX-1187 of 11/12/02) and long-term economic development strategy of Lithuania until 2015 (approved by the Government of the Republic of Lithuania, № 853 from 12.06.02), it is determined that an important part of ensuring development is the active use of the scientific potential, increasing the volume of investment in infrastructure of science, and education priority funding for research programs, as well as introduction of new technologies.

The concept of science and technology parks (approved by the decision of the Government of the Republic of Lithuania № 963, 18.07.03), the development of high technology (approved by Resolution of the Government of Lithuania № 1645 of December 22 , 2003), long-term strategy of scientific research and experimental development program and the implementation of the White Book of Science and Technology in Lithuania (approved by the decision of the Government of the Republic of Latvia № 1646, 22.12.03), are also aimed at implementing the policy of innovative development of the country, to improve the economic environment for innovation, provide financial support for innovation to solve complex problems.

Institutional scheme of innovative activities in the Republic of Lithuania

The Lithuanian Seimas

Government of the Republic of Lithuania

Scientific and technological commission	Research Council	Academy of Sciences
The Ministry of Economy	The Ministry of Education and Science	Other Ministries

Innovation centers	Science and technology parks	Business Incubators	Information business centers	Agency for Development of Small and Medium Enterprises	Lithuanian Economic Development Agency

Enterprises

The activities of the Lithuanian Innovation Centreare aimed at increasing the international competitiveness of business in Lithuania by an intensification of new technological solutions and organizational initiation of their implementation in enterprises.

Innovation Centre provides services aimed at:

- International technology transfer (import and export of technology, studying technology needs of businesses and the search for partners abroad who can meet these needs, their identification and finding ways of acquiring these technologies);
- Informing about the programs of technological development of EU;
- Innovation support, providing information on intellectual property protection, licensing, financing innovation;
- Advice to enterprises in initiating and implementing innovative projects using EU structural funds assistance.

Innovation Centre created a special portal on the Internet www.innovation.lt. This simplified access to any relevant information. In addition, in the Kaunas University of Technology in 2002, at the Centre for innovation and the Department of Information, was created Department of Innovation and Information (www.ktu.lt).

Business incubators in Lithuania can be divided into two types:

- *Industrial* — patronized by entrepreneurs engaged in productive activity, retail trade and services. At that, one of the founders of such incubators is the city or district council;
- *Technological* — incubators, one of the founders of which must be scientific or educational institution. In these incubators are engaged business entities that perform applied research, create new products or use intellectual products.

Scientific and technological parks of Lithuania

Name	Address	Head	Contacts
1	2	3	4
Vilnius Science and Technology Park	Vilnius, Goshtauto St., 11	Vytautas Balchyunas. Founders: Ministry of Economy of the Republic of Lithuania, Institute of Physics and others.	Tel. 3705 2313763 Fax 3705 2626720 www.stp.lt info@ruta.stp.lt
Kaunas Park of High and Information Technologies	Kaunas, Breslaues St., 3	Povilas Yankus Founders: Ministry of Economy of the Republic of Lithuania, Kaunas University of Technology, Institute of Energy	Tel. 370 37 401810 Fax 37037 401940 Infopark@isag.lei.lt
Klaipeda Science and Technology Park	Klaipeda G.Manto St., 84	Romu Stubryenye Founders: Ministry of Economy of the Republic of Lithuania, Klaipėda University	Tel. 37046 398998 Fax 37046 398902 www.mtp.ku.lt parkas@takas.lt
Technology Park of Northern campus	Vilnius, Galvidzhio St., 5	Gintaras Brentsyus. Founders: Ministry of Economy of the Republic of Lithuania, Vilnius Municipality	Tel 3705 2745411 Fax 3705 2745422 Info@ntp.lt www.ntp.lt
Visoriai Information Technology Park	Vilnius, Akademies St., 2	Henrikas Makutyenas. Founders: Ministry of Economy of the Republic of Lithuania, Vilnius University, Vilnius Gediminas Technical University, Institute of Mathematics and Computer Science and others.	Tel. 3705 2109256 Fax 3705 2109257 Info@vitp.lt www.vitp.lt
Science and Technology Park of the University of Siauliai	Siauliai, Vilnyaws St., 88	Vida Stasyunayte Founders: Siauliai University, municipalities and other companies	Tel. 370 41 512212 Fax 370 41 512212 Mtp@sumtp.lt www.sumtp.lt

The Lithuanian Development Agency of Small and Medium Enterprises was founded in 1996. The founder, owner and supreme body of its management is the Ministry of Economy of Lithuania.

Republic of Moldova

The legal framework of the innovative activity is regulated by the Constitution, the Code on Science and Innovation of the Republic of Moldova, the laws of the Republic of Moldova «On the state policy in the field of innovation and technology» №289 of 10.07.03 and «On the scientific and technological parks and innovation incubators» № 138-XVI from 21.06.07. The aim of this regulatory framework is to promote activities in the field of innovation and technology transfer aimed at implementing the results of scientific research and innovation in creating new products, services and processes.

<u>The structure and components of public infrastructure to support innovation</u>

Public infrastructure to support innovative activity in Moldova includes a set of organizations that contribute to the implementation of activities in the field of innovation and technology transfer: financial institutions, funds and agencies to support the activities in this area, business incubators, innovation parks (scientific, technical and technological), centres of excellence and other specialized organizations.

In accordance with Article 131 of the Code on Science and Innovation of the Republic of Moldova, according to the scientific, institutional and social status in the field of science and innovations are the following types of organizations:

a) Research Institute with branches
b) Research enterprise
c) Innovative enterprise
d) Research Centre
e) Innovation Centre

f) Research station

g) Separate scientific laboratory

h) Higher education institution with structures in science and innovation

i) Scientific and innovative association, scientific, technological, scientific and educational clusters

j) Research Fund

k) Innovation Fund

l) Financial institution supporting activities in science and innovation

m) Scientific and technological park, innovative incubator and Technopolis

n) Science Museum

o) Research Library

p) Research archive

q) Scientific publishing house

r) Other organizations in the field of science and innovation

<u>Mechanisms to promote innovation</u>

The state, under current law, guarantees to subjects of activities in innovation and technology transfer:

- Government support of programs and projects in the field of innovation and technology transfer aimed at realization of state policy in this area;
- State support for the creation and development of infrastructure in the field of innovation and technology transfer;
- State support for training, retraining and advanced training in the field of innovation and technology transfer;
- Protection of intellectual property;
- Free access to information and its dissemination in accordance with current legislation;
- Support of international cooperation in the field of innovation and technology transfer.

In accordance with Article 17 of the Law of the Republic of Moldova "On the scientific and technological parks and innovation *incubators" in order to stimulate activity of the scientific and technological park and innovative incubator residents of scientificall and technological park and residents of innovative incubator:*

- Enjoy tax and customs privileges;
- Obtain funding on a competitive basis under state programs and projects from the field of science and innovation, including the creation and / or development of innovation infrastructure;
- Use the investment and equipment received from individuals and legal entities of public or private law, as well as external financial assistance;
- Receive donations, sponsorship andinvestments;
- Have favourable conditions of property lease, use of infrastructure and communications, including through instalment payments;
- Enjoy the benefits or are exempt from payment of tariffs.

According to the Law of the Republic of Moldova "On Customs Tariff", they are exempt from import duties on technological equipment, gear, equipment and working capital, imported by organizations in the sphere of science and innovation, accredited by the National Council for Accreditation and Attestation for activities in the field of science and innovation.

The main criterion for evaluating the performance of institutions providing innovation support, and businesses that receive it, is the indicator of the volume of production of innovative products and services (in value terms).

Russian Federation

The institutional foundations of scientific and technical and innovative sphere of Russia

The main body of the executive authorities of the Russian Federation, which ensures the development of public policy and legal regulation in the sphere of scientific, technical and innovation activities, the development of federal centres of science and high technology, is the Ministry of Education and Science (MES) of Russia. The basic structural units of the Ministry of Education of the Russian Federation, which are responsible for performing the specified functions and are the main managers of budgetary funds in this area, are:

– Federal Agency on Science and Innovations;
– Federal Service for Supervision of Education and Science;
– Federal Service for Intellectual Property, Patents and Trademarks;
– Russian Academy of Sciences;
– Lomonosov Moscow State University;
– Russian Foundation for Basic Research;
– Foundation for Assistance to Small Enterprises in the scientific and technical sphere.

In 2007, the Ministry of Education and Science drafted a long-term forecast of scientific and technological development of the Russian Federation for the period up to 2025, and attempted to establish the national priorities for scientific and technological development.

To date, there was approved a new charter of the RAS, which allows it to determine the main directions of fundamental research on technical, humanities, and social sciences, as well as to dispose of the rights of intellectual property and other results of scientific and technological activities. Currently are prepared for approval the statutes of other state academies. It is expected that the adoption of these documents will increase the efficiency of the state academies of sciences through greater autonomy and increased accountability for results.

Determined priority directions of development of scientific and technological potential of the Russian Federation

In the context of sustainable intensive development of scientific and technological potential, MES of Russia pursued its aim of achieving planned indexes in 2008-2010 in two main priority areas:

1. Creation of conditions for development and effective use of scientific and technological potential.

1.1. Improving the efficiency of science and technology through optimizing the network of public research organizations, concentration of resources in priority areas of science, technology and engineering, improving the quality of regulation in this area.

1.2. Priority development of fundamental science, preservation and support of leading scientific schools, promoting reproduction and improving the quality of its human resources, including training of highly qualified personnel.

1.3. The integration of educational and scientific activity, the development of university research and the creation of research and education centres.

1.4. Development of material and technical base of fundamental and applied sciences, including the provision of modern equipment, instruments and materials, improving the functioning of the infrastructure of scientific organizations.

1.5. Integration of Russian science as a subject of global scientific process.

2. Creation of conditions for innovation activity.

2.1. Creation of conditions for increase of innovative activity and susceptibility of the enterprises and organizations for innovation and advanced technologies as a means of ensuring the competitiveness of their products.

2.2. Providing incentives for innovative activity by the state, creating conditions for the development of public-private partnership, development and implementation of major innovative projects (programs) of state importance.

2.3. Creation of infrastructure of the Russian innovation system.

2.4. Creating the conditions for attracting results of scientific and technological activities in the economic cycle, the formation and development of the market for intellectual property and ensuring its legal protection.

2.5. Activation of small innovative business.

According to Russian experts, the main problematic issues that prevent the solution of problems in the field of reproduc-

tion and the effective use of scientific and technical potential, as well as creating conditions for innovation activity are:

- The delay of the institutional structure of science' reform as a result of the reluctance of the scientific organizations move on to the new organizational and legal forms (Russian science is represented mainly by public research institutes, characterized by low capitalization and isolation from the higher education sector and the real sector of the economy;
- The underestimation of the degree of physical and moral state of the main foundations of scientific organizations, the update of which requires substantially more funding than budgeted;
- The inertia of the processes of renewal of scientific personnel (planned increase of wages in the sphere of science and other social measures may not be sufficient for large-scale involvement of young people in science);
- Remaining economic, organizational and legal barriers to the development of international scientific and technological cooperation;
- Remaining gaps and inconsistencies in the regulatory framework regulating activities and conditions of operation of research institutions and universities;
- The loss of leading positions in a number of branches of fundamental science, which negatively affects the prospects of increasing the competitiveness of Russian science, the reduction of scientific and technological gap with the developed countries and capacity building for long-term economic growth;
- The underestimation of the scale of the reduction of the Russian innovation and technological base, as well as the gap in the technological level of production compared with world leaders;
- Lack of investment resources and skilled managers and engineers for the implementation of innovation in enterprises;

- Lack of demand for Russian scientific developments and technologies from the real economy due to their low level in comparison with foreign analogues;
- Insufficient integration of Russian companies into the global high-tech market and the lack of experience in the commercialization of research and development.

The principal priority for the development of modern Russian science is nanotechnologies. **According to the presidential initiative "The development strategy of the nanotechnology industry", in the Russian Federation was adopted federal target program (FTP) "Development of infrastructure of the nanotechnology industry in the Russian Federation in 2008-2010". Federal Law of July 19, 2007 № 139-FZ established Russian Nanotechnology Corporation.**

The main problems of modern Russian science include:

1. The sharp reduction in the number of personnel engaged in research and development in recent years (for the period 1990-2005, it has fallen by more than half).

2. Insufficient or no capital investment in the equipment and instrumental base, leading to aging, and in some areas - the practical lack of scientific and special equipment, instruments and devices that meet the requirements of the modern world.

3. The growing inequality in the distribution of funding of science between the regions, which, in particular, provides the Moscow region a significant advantage over other administrative-territorial units of the country, and the absence, in this regard, effective steps from the Ministry of Education of the Russian Federation for the development of regional centres of Advanced Studies.

4. Low interest of Russian private business to invest in science and innovation, the main source of financing of which is the federal budget. According to the Ministry of Economic Development of the Russian Federation, the share of the business sector in the financing of science in Russia today is less than 30%,

whereas the same index in the US is 63.7%, Germany - 66.8%, Japan - nearly 75%.

The main provisions of the Russian concept of national research university

The main provisions of the Russian concept of “national research university” are as follows:

National Research University (NRU) is a real embodiment of the new approach to the qualitative modernization of the sector of science and education and new institutional form of organization scientific and educational activities, designed to take on the main burden of personnel and scientific maintenance of requests of the high-tech sector of the Russian economy.

The research university is a higher education institution, which performs educational and research activities with the same efficiency based on the integration of science and education. The most important distinguishing features of the NRU are both the ability to generate knowledge and to ensure an effective transfer of technology in the economy, as well as carry out a wide range of basic and applied research. It is also the availability of highly effective system of training of masters and highly qualified personnel, a developed system of retraining programs and advanced training. Practically NRU must be an integrated scientific and educational centre or include a number of such centres as a combination of structural units engaged in research on the overall scientific direction and training for certain high-tech sectors of the economy.

The strategic mission of the NRU is to promote the dynamic development of the scientific and technological complex of the country and to provide it with the necessary human resources, balanced in numbers, areas of training, qualification and age structure, taking into account the required rate of reproduction and projected structural reforms in science and economy.

The main objective of the state support of the Institute of NRU is access to world-class educational institutions that can take responsibility for the preservation and development of human resources of science, high technology and vocational education, development and commercialization of high technologies in the Russian Federation.

Key indicators of scientific activity of research university in the Russian Federation

Key indicators of scientific research university should reflect sustainable over the years:

- Relevance of work performed;
- Their federal and regional level;
- The scope of conducted research;
- The importance of basic NRU;
- Productivity of applied research;
- The effectiveness of the commercialization of R&D results
- Use of results of research and development in the educational process;
- The activity of the scientific work of students and young scientists.

It is significant that some of the indicators may be repeated, reflecting different aspects of the work of a research university.

<u>*Indicators that reflect the relevance of research and development, include:*</u>

- *Availability of scientific schools, with the status of the leading scientific schools in Russia*
- *Availability of grants of RFBR, RHF, ministries, departments, constant over the years*
- *Scientific monographies published by central and foreign publishers*
- *Projects of STP of ministries and departments*
- *Availability of grants from international foundations and programs*
- *Availability of new educational technologies and high-performance computing centers*
- *Volumes of research and development carried out under the agreements for enterprises and other economic entities*

The indicators of the level and scale of carried out research include:

- Awards of international and national level
- Doctoral and master's dissertations
- Large national and international scientific, technical, and technological projects
- Medals and prizes of international and national scientific and technical exhibitions
- Patents and licenses
- Availability of scientific coordination centers of the national and regional levels
- Volumes of of attracted resources and budget
- Availability of the Research Institute within the structure of the University

The indicators of the importance of work performed include:

- Awards of international and national level
- Medals and awards of foreign and national exhibitions
- Availability of scientific coordination centers at national and regional levels
- Availability of unique objects and equipment
- Availability of centers for collective use
- Availability of high-performance technology centers
- Doctoral and master's theses
- The number of doctoral and master boards

Indicators of quality of work performed:

- Awards of international and national levels
- Efficiency of graduate and doctorate study
- The number of grants of international and national funds
- Number of monographs published in the central publishing houses

Performance indicators of applied R&D:

- Numbers of contractual SRI
- Grants and projects of STP

The effectiveness of the commercialization of R&D results is as follows:

- The number of existing licensing agreements
- The number of registered patents for inventions
- The number of contractual R&D

Availability of advanced infrastructure and material and technical base in the university can be characterized by the following indicators:

- Availability of research institutes, research laboratories and the number of full-time research staff
- Availability of unique research facilities
- Availability of TCP
- Availability of high-performance technology centers
- Availability of technology parks, innovation centers

It is advisable to distinguish a separate set of indicators describing opportunities of the university, and the effectiveness of training of highly qualified personnel:

- Availability (number) of doctoral boards
- Availability (number) of candidate boards
- Number of post-graduate and doctoral specializations
- The total number of doctoral and postgraduate vacancies
- The number of professors and associate professors, assisting graduate students
- Efficiency of postgraduate and doctoral studies

The essential indicators of scientific, educational and scientific base include:

- Capacities of Research Library
- Availability of internet center
- Capacities of telecommunication network
- Availability of publishing houses, editors, including those included in the list of the Higher Attestation Commission
- The number of periodicals published by the university

Effective integration of the university into the international scientific community reflect the following indicators:

- Joint international scientific and educational projects and programs (number, scope)
- Common (international) scientific and educational centers

- Grants of international programs and funds.

The effectiveness of the research work of students and young scientists can be characterized by the following indicators:

- State awards for young scientists
- Number of presidential grants received for support of young scientists
- The number of medals of the RAS, RAMS, diplomas of RF Ministry of Education and international organizations for young scientists
- Number of grants of national and foreign funds received by students and young scientists
- The number of student competitions, contests, conferences
- Internships of students, graduate students and young scientists in the leading scientific centers
- Physical and mathematical schools and other schools, preparatory training centers.

One of the most important indicators of scientific activity of the research university is prospects of the main areas of training of scientific personnel.

ASIA
The Republic of Kazakhstan

The basic legal documents of innovation policy of the country is the Strategy of Industrial and Innovation Development of Kazakhstan for 2003-2015, program on the formation and development of the national innovation system of the Republic of Kazakhstan for 2005-2015, the Law of RK «On state support of innovation activity». The implementation of these policy instruments is based on 2-year state and regional programs of industrial-innovative development, and decisions of relevant ministries.

Strategy of Industrial and Innovation Development of the Republic of Kazakhstan is aimed at the formation of the state economic policy of Kazakhstan for the period up to 2015, and aims to achieve sustainable development through economic diversification and transition from extraction to processing industry development.

The main objectives of the Strategy of industrial-innovative development of Kazakhstan are:

- Ensuring average annual growth rate in the manufacturing industry in the range of 8-8.4%, increase in labor productivity in 2015 no less than 3 times compared to 2000, and reduction of energy intensity of GDP in 2 times;
- Increased productivity of capital assets of processing industry;
- Creating a business environment, structure and content of public institutions that will encourage the private sector and improve the competitive advantage, develop the elements in the chain of added value in specific industries seeking the greatest added value;
- Stimulating the creation of high-tech export-oriented industries;
- Diversification of the export potential of the country in favor of goods and services with high added value; the transition to international quality standards;
- The development of integration in the regional and world economy with participation in global scientific-technical and innovative processes.

Production of competitive and export-oriented goods and services in the manufacturing industry and the service sector is the main subject of the state's industrial and innovation policy.

JSC "National Innovation Fund"

National Innovation Fund was established according to Governmental order of the Republic of Kazakhstan dated May 30, 2003.

The main purpose of the Innovation Fund is to increase the overall innovation activity in the country, including the promotion of high-tech and knowledge-intensive industries.

Overall, NIF stimulates venture function of the market economy, which is not even present in all developed countries. This feature is most important for the creation and development of high-tech industries such as information sector, electronics, biotechnology and others.

The existence of the Innovation Fund should solve the systemic problem of the lack of effective market mechanisms for innovation, which is inherent in all the countries of the former Soviet Union.

The country formed a *two-tier system of technology parks*–**national and regional parks**. A distinctive feature of national technology parks is the presence of sectoral focus in their activities and the regime of the special economic zones with preferential taxation.

In Kazakhstan today operates more than 40 business incubators.

It is predicted that the creation of business incubators in the technology parks would result in a gradual inclusion of all innovative initiatives proposed by Kazakhstan developers that will make more than 300 projects each year.

The main objective of the technology parks is identification, realization, and development of innovative potential of the country, especially its regions, as well as ensuring the needs of the economy in innovative products.

Creation and further development of technology parks in Kazakhstan is intended to solve the main problem in the formation of a competitive manufacturing sector of the economy - strengthening the link between science and production, introduction of modern technologies, increasing the productivity of labour in industry and, as a consequence, the production of high-tech and competitive products.

The activities of technological parks in Kazakhstan are carried out according to the modern European model, which has the following features:

- Availability of the building, designed to accommodate dozens of small firms, (which contribute to the formation

of a large number of new small and medium-sized innovative enterprises enjoying all the benefits of collective services);
- Service system consists of a complex maintenance and simple service, recruited from the companies that make up the service sector, necessary for the formed structure of innovative enterprises.

Thus, in the territory of Almaty regional technopark are located more than 10 small companies, providing a wide range of services for the implementation of innovative projects, including banking, consulting, legal aid, and others.

Allocation of Technology Parks according to the level of impact

Kazakhstan Technology Parks, of which there are about ten in the country, are given the status by level of influence on the elements and members of the research system:
- National scientific and technological parks;
- Regional technological parks.

Among the national science and Technology Parks are the following technological formations:Information Technology Park, village Alatau, National industrial petrochemical technopark in Atyrau, Technology Park of nuclear technology “Tokamak” in Kurchatov, Technology Park of space monitoring in Almaty, Astana and Priozersk.

National Technology Parks are focused on the creation of new industries in Kazakhstan, which should help to ensure the future competitiveness of the Kazakh economy.

Regional Technology Parks, including the Almaty Technology Park, Almaty; Technology Park “Algorithm”, Uralsk; Technology Park “Business City”, Karaganda, are created in order to determine, realize and develop innovative potential and innovative capacity of the region, ensuring the needs of the regional economy in innovative products.

At the regional level, systemically important constituent parts of Technology Parks are industrial enterprises of regions, scientific and academic organizations. Regional Technology Parks provide a gradual increase of the technological level of the economy and create conditions for small and medium high technology and manufacturing business.

Particularities of the location of Technology Parks

One of the characteristic features of Kazakhstan Technology Parks is their location on the territory of large enterprises with the involvement of the leading universities and research institutes.

For example, three of the 10 national Technology Parks are located in high schools, such as Al-Farabi Kazakh National University, Satbayev Kazakh National Technical University and East Kazakhstan State Technical University named after D. Serikbayev; the rest 7 of them are operating on the territory of industrial enterprises and research centres.

Most of the Technology Parks in Kazakhstan, as well as all over the world, are located in the major cities and industrial centres, with the presence of academic institutions and qualified specialists. About 60% of Technology Parks are located in cities such as Almaty, Astana, Atyrau and Karaganda, while others operate in medium and small cities, such as Ust-Kamenogorsk, Uralsk and Stepnogorsk.

Availability and structure of the main elements of Technology Parks in Kazakhstan - business incubators

Some Kazakh Technology Parks contain so-called business incubators i.e. building or several buildings where created small businesses rent premises for a limited time (2 to 5 years).

During this time, the company must realize its potential and go beyond the Techno Park (88% of Technology Parks in the world have one or more business incubators). According to the US National Association of Business Incubators, the ratio of successful companies and the bankrupt ones under normal conditions is 20:80, and in business incubators, it is just the opposite - 80:20.

The main share of clients of incubators in Kazakhstan make companies engaged in the production (food, garment, furniture, craft and souvenir production) and service providers (in the field of training, consulting, and construction and repair work). Only 2% of customers of business incubators are engaged in technology, while the business incubator has to “merge” with high-tech companies from the earliest stages - from inception of the idea.

Among the services offered by Kazakh techno parks, to date, there should be noted:

– Renting production and administrative areas;
– Organization of rental of technological equipment;
– Provision of public utilities and communication services.

Analysis of the activities of Technological Parks in Kazakhstan can identify a number of modern trends in their development:

- The increase in the number of Technology Parks.

The country established and registered more than 10 of Technology Parks over the last decade. In the next five years, technology parks can be an important element of the national innovation system of the republic, because these objects of innovation infrastructure are elements that contribute to the introduction of modern technologies, increasing labour productivity and manufacturing of high-tech products.

- The prevalence of regional development in the Technology Parks of the country.

Today, along with the development of fundamental science, it is necessary to launch regional innovative mechanism through the creation of Technology Parks in every region of Kazakhstan taking into account available scientific and technical potential, mineral resources, industrial infrastructure and regional development priorities, the core of which could become regional universities.

In this regard, the country is experiencing an increase in the number of regional Technology Parks, there were created several of them: Technology Parks “Algorithm”, Technology Parks “Business City”, Almaty regional Technology Parks, etc. All of them were created to stimulate regional and local development, to meet the needs of the regional economy in innovative products.

- Increasing the number of Technology Parks in medium and small cities.

- Increasing the number of business incubators in Technology Parks.

All the activities of incubators are aimed at developing of an integrated and permanent structure that would give small businesses the necessary operational support for the development of business projects.

Today, Kazakhstan has more than 100 thousand small businesses (legal entities), so the creation of business incubators will be a key point in the development of small business facilities as full members of the economic environment of Techno Park and the region.

In general, trends in the development of technological parks in Kazakhstan are similar to the development trends of the innovative infrastructure system of the world, and confirm the correctness of the choice of ways of development of innovation policies.

Thus, it can be noted that the introduction of such innovative structures as technology parks is quite active in Kazakhstan. The current system of technological parks deals with the formation of innovations market and copyright protection, as well as the creation of conditions for the implementation of investment projects.

The Republic of India

In November 2008, the Federation of Indian Chamber of Commerce has developed an innovative project «India Innovation Act» and passed it to the Government of India. The adoption of this legal act is aimed at increasing investment in research, strengthening educational opportunities in the fields of mathematics, science and technology and development of innovation infrastructure.

According to the World Bank report «Global Competitiveness - 2008», India ranks 26th in the overall ranking of innovative factors.

In this context, there should be highlighted such factors of the rating:

- Availability scientists and engineers - 4th place;
- The quality of scientific research institutions - 22nd place;
- Expenses of corporations for research and development - 28th place;
- Opportunities for realization of innovations - 31st place;
- Cooperation of universities with industry - 44th place;
- Patents - 62nd place;
- Government support for new technologies - 71st place.

In recent years, the Government of India developed an extensive institutional infrastructure in the field of information, in particular:

- Division of the development and implementation of electronic law;
- Certification control Authority;
- Appeal Tribunal in the area of software;
- Register of projects of integrated circuits;
- Directorate for certification, standardization and quality control in IT.

Among the main activities of the National Innovation Fund (NIF) (http://www.nif.org.in), which was founded in 2000, we can mention the following: the creation of a database of pre-selected innovative projects for which appropriate funding is allocated; support for research; the development of relations between academia, producers and entrepreneurs; creating a positive image of India as a country with a high level of achievements in innovation.

People's Republic of China

One of the innovative structures of the Chinese government is The National Development and Reform Commission of the People's Republic of China (NDRC), as part of which there is a Department of High-Tech Industry, which is responsible for the strategy and planning of the development of high-tech industry in China, the promotion of innovation, promotion and organization of major innovative projects involving foreign investment, coordination and authorization of innovative projects with plans for economic and social development of the countries. It is also responsible for the integration and collaboration of research institutes and enterprises to introduce innovations into production.

The main source of financing of innovative activity in China is the State Innovation Fund of support for small enterprises that introduce new technologies. State Innovation Fund for Small Enterprises provides financial support to Chinese enterprises of all types of property that are involved in the production or services, engaged in research and development work, have a sufficient level of innovation developments and are competitive in the market of high technologies. The preferential funding is also granted to businesses founded by scientists and researchers, as well as former students and post-graduates with appropriate education, who returned to China after studying abroad. Particular attention is also given to joint projects created with the participation of enterprises, universities and research institutes.

The Republic of Singapore

Public infrastructure to support innovation and the institutions involved in it

The Council for Research Innovation and Enterprise (Research, Innovation and Enterprise Council, RIEC), subordinated directly to the Prime Minister of the country, develops innovation policies in Singapore. The Council consists of both public officials and representatives of private companies.

Reference*: National research program includes the following priorities:*

- *Bringing the level of funding for research and innovative activity to 3% of GDP by 2010*;
- *Defining strategic areas of research and innovation and their financing;*

- *Determining the balance of basic and applied research according to approved strategic directions*;
- *Attracting the private sector in research and innovative activity;*
- *Strengthening ties between the public and private sectors in the field of research and innovation.*

Mechanisms to promote innovation

The program is implemented in four main areas:

Building Strategies of management and technological development of companies. Within this framework, the experts of the Agency A-STAR provide companies with assistance in developing technology "road map" for a number of products or services with which the manufacturer wishes to enter the market. This "roadmap" provides a thorough understanding of the technological side of the realization of a project, reveals the critical system requirements, and key areas of technological development in order to achieve optimal performance. Thus, the "road map" ensures that the new technologies, which the enterprise adapts, is adequate to the tasks and have a positive impact on its development. At that, some companies receive financial assistance for the purpose of their technological modernization.

Promoting the commercialization of promising innovations

The aim of the project is to provide a permanent base of the technology transfer of its members, and hence maximization of commercial potential of accumulated intellectual property.

The main functions of the project are:

- Ensuring the exchange of knowledge and experience with respect to technology transfer by means of regular meetings of authorized representatives of the participating organizations;
- Common portfolio management of intellectual property assets through their accounting and effective use among members of the network and outside of it;

- Expanding access to the market through joint marketing activities and the activities of specially created technology consulting services (Technology Advisory Services);
- Enabling the necessary skills and possibilities for personnel of the network of participating companies through their systematic involvement in the appropriate education and training programs.

Turkish Republic

Revitalization of innovation development is based primarily on the sufficient legal base and a substantial increase in public funding.

Activities of innovative projects (of technological parks or areas of technological development, the functional features of which are very similar) in Turkey are regulated by the Law of the TR № 4691 «On the technology development zones», which came into force in 2001. This law aims to ensure effective cooperation between higher education institutions and industry objects to create a globally competitive industrial complex. The law defines the conditions for the creation of innovative structures in the TR, which accumulate scientific and technical knowledge and implement economization of knowledge; raise the standards and quality of high-tech products; develop innovations to increase productivity and reduce production costs; implement innovations by small and medium-sized businesses; provide the necessary conditions for researchers; contribute to the activization of investment of foreign capital in the national innovation sphere, and the like.

According to regulatory documents, the main goal of activities of technology parks in Turkey is to ensure cooperation between universities, research organizations and industrial sector.

There has been an intensification of the University Park «ARI Teknokent» at Istanbul Technical University as an effective mechanism for the implementation of research results in industrial production. Currently, «Teknokent» includes about 300 companies, more than half of which work in the field of electronics, software and communications. This industrial park is growing, not only quantitatively but also qualitatively: recently among firms to establish «incubators» in territory of techno park of ITU, are leading companies and industrial enterprises of Turkey. Thus, with the only two representatives of leading local companies such as «Türk Telekom» and «Vestel», joining the «Teknokent», the number of personnel of Techno park doubled. As part of these activities, local small and medium "hi-tech" companies are provided with free information and consulting services.

In Technology Park at the University Hadzhettepe, there are about 140 companies, the bulk of which, depending on specific the university, specializes in medical technology as well as software, information technology and electronics. In 2007, the Techno park completed construction of the new centre in the area of 14,000 m2, which created additional opportunities to attract about 100 new companies in the structure of the technology park.

Government agencies improve legal system of regulation and stimulation of innovation, so that about half of the total amount of funding for the sector of Research and Development of TR would be carried out by the private sector.

Now in the TR is created a system of powerful innovative structures, which, according to international standards, interact and compete with each other in terms of the volume of financing and the quality of high-tech products. This is an indicator of Turkey's transition to a qualitatively new phase of scientific and technological development.

In Turkey, operates 30 industrial parks, 18 areas of technology development, incubators and the like, some of which operate on the basis of regulated industrial zones and universities. Number of technology parks in the state universities and private forms of ownership increases. Accordingly, substantially increases the number of qualified staff and projects executed in the structures of innovative focus.

Ensuring the participation of the country as a full (associate) member in the framework of European programs, RP 6 and RP 7 helped enhance the development of the infrastructure of the Turkish Research Area. Thanks to the country's experience in the implementation of RP 6 and ambitious measures taken by the government to inform and encourage participation in the program of academic, educational and business organizations, the TR was able to achieve positive results in RP7.

One of the priorities of the current government of the Republic of Turkey is the production of high-tech, globally competitive products for the purpose of their use and exports. This is not just a declaration, but also a systemic consistent work, in particular, the creation of the appropriate juridical framework, major investment in the development of innovative structures. **National Strategy for development of science and technology 'Vision - 2023 "** (in 2023 will be celebrated the 100th anniversary of the founding of TR) determines the leading role of science and technology in the development of Turkish society and improvement of living standards. Accordingly, at the national level are carried out comprehensive measures to support local companies working in this direction and contributing to the implementation of the results of innovative research and development into production. One of the mechanisms of such support is the development of a national system of technology parks and other innovative objects that certainly not only facilitates the management of innovation, but also stimulates scientists themselves.

Japan

1. Components of the public infrastructure to support innovation.

According to Japan's basic law on the development of science and technology issues of planning, formulation and overall coordination of science and technology policy **deals the Council on policy issues in the field of science and technology. The**

Prime Minister of Japan heads the Council, which comprises of 14 members, including the Japanese Minister of State on science and technology, and scientists working in the most important sectors of the country.

2. The institutions directly involved in innovation activities.

According to administrative reform of 2001, the legal status of many national research institutions was changed to Independent Administrative Agency (IAA). This significantly raised the level of freedom of decision-making of personnel and financial management, and provided an opportunity to receive funding from private corporations.

3. Mechanisms to promote innovation.

The law mandates the development and support of the Council's policy in the field of science and technology (CPSTJ) under the Cabinet of Ministers of Japan, the so-called "Basic plan for science and technology development in Japan." The Plan sets out the policy of basic research and development and their application in society and the economy.

This plan is based on the following key positions:

1. Science and technology should be supported by community and useful to society.

2. Focusing on the development of human resources and the development of competitive Sciences for Environmental Studies.

Currently CPSTJ has already identified 273 "key research subjects" and 62 "strategically oriented sciences" in all 8 areas. Among these 62, five "long-running" projects are national in nature:

1) Development of space transportation technology;

2) Development of fast neutron reactors;

3) Development of the next generation of supercomputers;

4) Systems for monitoring and probing of the earth and ocean;

5) Development of electronic laser without a nuclear explosion.

According to the Development of Science and Technology of Japan plan, these five projects will be subject to annual reports on the implementation and, if necessary, review and amendments.

In addition, the reform of research and innovation system in Japan also deals with simplification of visa regime for foreign scientists.

4. Sources of financing and conditions to support innovation

Departments responsible for innovation policy, use the same tools for its implementation:

- Direct funding of their research organizations;
- Direct funding of individual research projects and programs;
- Funding of individual research projects and programs through specialized agencies at ministries.

Government can finance both supported projects and projects of private research organizations and universities.

5. Criteria for assessing the effectiveness of the institutions that provide support for innovation and businesses that receive it.

Activities of the organization and effectiveness of projects is estimated by the following criteria:

1. Evaluation of the roadmap of the project, including the socio-economic effects of the project, a plan of measures to implement the project, technical elements, comparison with other projects.

2. Impact assessment of the project, in particular the quantity and quality of scientific articles and press releases written about the project, the number of patents and awards, project prototyping.

3. Evaluation of project management, including leadership and human resources involved in the project, the formation of the project, project budget, intellectual property, technology transfer, cooperation with other research institutes and so on.

AMERICA
Canada

Canada as a whole, in contrast to other countries, makes no attempt at the successful commercialization of science and uses it only as a source for activities by innovative companies that aspire to market globalization. Canadian companies are rarely the leaders of the new technologies and often use innovations of the world leaders in a particular industry. Historically, Canada mostly skilfully adapts borrowed innovations.

The central element of the state strategy of innovative development of the Canadian economy is the innovation strategy of the government of Canada (hereinafter - the Strategy), adopted in February 2002, which stipulates a ten-year program of activities aimed at achieving accelerated development of innovation in the country, and appropriate public funding expenses for their implementation by Canada's federal budget for 2002-2012. This Strategy provides a mechanism for participation of other stakeholders in the planning and financing of its implementation, especially - provincial governments and territories of the country, municipalities and others.

Three types of organizations can develop innovative solutions:

– Own specialized structural units of enterprises and organizations, which will continue to apply them in practice;
– Research centres (especially in the educational institutions) which carry out research and development at the expense of customers;
– Specialized companies that develop innovations for their further implementation in the market.

The main agencies involved in the support and development of innovation activities in Canada are:

1. Ministry of Foreign Affairs and International Trade of Canada;
2. Ministry of Labour and Social Development of Canada;
3. Ministry of Infrastructure Development of Canada;
4. Canadian Innovation Centre;
5. Agency for Export Development of Canada (EDC);
6. Inter-provincial training program for future specialists and others.

Today in Canada, there are following government programs or programs with government support implemented by the federal and provincial governments, municipalities, private companies and foundations:

Name of government initiative	Jurisdiction / support of organizations					Institutions, organizations and programs involved in the implementation of the initiative
	Individ-ual	Feder.	Prov.	Munits.	Others	
Innovations in business strategy	X	X	X		X	- Support Programme for Industrial Research -Canadian Innovation Centre; - Expert Group on commercialization - The Canadian textile program (CANtex) - Business development programs - The Research Council for Natural Resources and Technology - Atlantic Innovation Fund - Round tables.
Use of-sound businesspractices	X	X	X		X	-Industrial Research Support Program - Atlantic Innovation Fund - Business Development Program - Highly efficient production
Developing a strategic and integrated approach to creating centers of business experience	X	X	X	X	X	- Research Communication Centre - Center for Transport Development - Canadian Innovation Centre - Business development program - Working Group on innovation.

The state incentive support for innovation, identified by market opportunities	X	X	X			- Canadian research initiative of lightweight materials - Working Group on Innovation - Canadian Innovation Centre - Canadian Innovation Fund - Technology transfer in the field of public health - Expert Group on Commercialization - The Canadian textile program - Business Development Program - Atlantic Innovation Fund - The Research Council for Natural Resources and Technology - National Strategy for the aerospace and defense industries.
Increasing access of private sector to application of expert knowledge						- Support Programme for Industrial Research - Business Development Program - Atlantic Innovation Fund - Support for communications workers at the industrial enterprises - Research and Development Communication Centre - Canadian technology network - The initiative «Innovation and development of skills» - Agricultural policy.
Improving access to the government program, including research andexperimental development. Programme of tax initiatives	X	X	X			- Support Programme for Industrial Research - Research and Development Communication Centre - Working Group on Innovation - Canadian Innovation Fund - Expert Group on Commercialization - Atlantic Innovation Fund - Business Development Program - The Research Council for Natural Resources and Technology The initiative «Innovation and development of skills»

In almost all advanced countries, government programs encourage the implementation of innovative activities in the national interest, and gain support from high-level government. Not only the domestic science and technology are encouraged to use the competitive advantages, but also enterprises and companies. Protectionist trends persist in the public financing of research sphere.

Financing of innovation, as a rule, is carried out at their own expense or at the cost of credit resources of developers or customers of various scientific developments. At the same time financing of innovation activities is carried out by commercial financial institutions on general grounds.

Simultaneously, taking into account the priority of innovative development of Canada and in accordance with the Strategy, the country has a set of programs to stimulate innovation activities of the state through grants and access to credit on favourable terms.

The main principle of state incentives for innovation is the use of mechanism of the direct project support of the innovative project, which compared with the mechanism of support through the provision of various benefits, has the advantages of targeting, transparency and flexibility, but obviously associated with the need for direct budget payments.

The criteria for assessing the performance of companies that receive government support for innovation are established by aforementioned institutions or governmental agencies in accordance with the terms of their activities and programs, or in accordance with developed mechanisms of providing such support separately for each initiative or program.

United States of America

Historically, the US legal framework provides the legal foundation for the development of innovative business on the principles of long-term and economic interest of entrepreneurs. Today it contains a wide range of laws on patents, trademarks, copyright, anti-trust legislation and tax credits, as well as laws that provide for the compulsory licensing of technology, on the promotion of investment in venture businesses and many others.

The most important source of scientific and technical knowledge and the basic mechanism of implementation of the policy of the US government on issues of innovation are federal laboratories and other research institutions of the state.

The US experience in the modernization of research universities

Special attention is given to the fact that in recent times, even for the most advanced national educational and scientific systems, issues of strengthening the integration of science and higher education received additional urgency due to the global financial crisis and the general slowdown of the economy. The crisis has greatly increased the negative impact of the decline in industrial production first of all in Western Europe and the United States. This is noted in particular in the study of the US National Council for Research, "Research Universities and the Future of America", (2012).

It should be noted that the term "research university", which has a wide international circulation, and in Ukraine is an official status of certain universities, in the United States does not have a normative but descriptive nature, serving as a designation of conformity of a university to certain educational, scientific and economic criteria. In general, the concept of "Research University" in the world today requires compliance of universities with several important criteria, including:

1. High share of funds received by the university to conduct basic and applied research (50% or more of the total budget, with funds obtained exclusively on a competitive basis, and not as benefits stipulated by special status).

2. The diversity of subjects taught in universities, a high proportion of degree applicants.

3. A significant number of teachers involved, including from abroad.

4. The presence of developed infrastructure, which includes both the infrastructure for actual training of students and post-graduate students and for research, as well as innovation infrastructure - small and medium-sized enterprises operating on the basis of and in partnership with the appropriate university, directly engaging in the commercialization of research results.

5. A high degree of training and research autonomy, strong corporate ethics, which provide high level and continuity of scientific schools and significant amounts of charitable donations from alumni who have achieved success in business

It is also worth noting that the classification of "research university" is assigned to American universities by non-governmental organization, the Carnegie Foundation for the Advancement of Teaching, which, when assigning ratings to universities and colleges functions as an independent agency of education quality assessment.

Institutional features and priorities of research universities in the US

From the point of view of modern organization of the practice of research universities, the US experience is of particular interest.

<u>Analysts distinguish the following development priorities of research universities in the United States:</u>

- *Polyfunctionality of the University, its ability to both generate and ensure the transfer of modern knowledge*;
- *Strong focus on research (especially basic) research and development*;
- *Presence of a system of training specialists with advanced degrees, with special importance given to the predominance of the number of masters and doctoral students over the number of students;*
- *Orientation of study on modern trends in science, mastering of high technologies*;
- *A wide range of disciplines and specializations, including the natural, social and human sciences*;

- *The high professional level of teachers recruited on the basis of competitions, including international ones; availability of opportunities to invite leading experts from around the world for temporary work;*
- *The high degree of openness and integration into the international system of science and education*;
- *Susceptibility to global experience and flexibility in relation to new areas of research and teaching methods*;
- *Competitive and selective approach to the student recruitment*;
- *The presence of a special intellectual environment at the university;*
- *The presence of corporate ethics based on the ethos of science, democratic values and academic freedom*;
- *Formation of the environment of the University as a specific technical, scientific and economic space often filled with technology park structures;*
- *Striving for leadership in the region, the country and the world scientific and educational community as a whole.*

Research universities tend to have strong links with industry. Thus, the largest American Research University – Massachusetts Institute of Technology has ties with about 300 US corporations.

An essential feature in the formation of the faculty of the American research university is a rotation of staff, covering education, science and business. Between them there are no artificial barriers, in fact, payment at the university, as in the company stimulates such rotation.

US Research Universities: financing structure, organizational structure

Research universities are actively involved, mainly on a commercial basis, in additional postgraduate education, offering multi-level program of training and retraining. In contrast to the business schools with a narrow specialization, universities are able to implement a variety of interdisciplinary programs.

Research universities is characterized by a multiplicity of funding sources: federal and local budgets, grants, charitable foundations and trustees, business, revenues from the educational, research, industrial and consulting activities. In the US the federal government accounts for 13.3% of all financial resources, the government of states - 30.3%, the local authorities - 2.7%, the private sector - 4.9%, students - 33.1%. Another 15% of the budget of the higher school contribute universities themselves from their funds and income.

<u>The modern research university</u> is a large economic entity, which naturally has great autonomy. Thus, the annual budget of the University of Texas is 3 billion USD, Stanford - 1 billion USD, Manchester Metropolitan University - 1 billion USD. Around this type of university, research parks are created as a form of integrated development of science, education and business. Research Park is a research and production, educational and socio-cultural area providing continuous innovation cycle, united around a centre of science (Research University).

The core concept of the research park is to create a special infrastructure providing connection of the research centre and a business that generates and supports small high-tech enterprises at the initial stage. The parks implement technology transfer, i.e. the transfer of new technologies and projects that emerged in the research centres, into manufacturing, bringing design to the stage of production.

Parks implement the integration of science, based in universities with business. Parks help scientists, engineers and programmers to bring their ideas to the stage of a commercial product, to become entrepreneurs, to organize their own small businesses. Technology parks, created next to the universities, but independent of them, on the one hand, ensure the commercialization of scientific research, provide additional income for teachers and students, on the other hand, creating a near-university structure of commercial activity, prevent excessive commercialization of the works of universities themselves.

The structure of each individual park is defined by its specialization, accordingly outlining the range of its activities. The structure of the park has a research department, computer centre, and an experimental manufacture company for the production of high-tech products, the service system of firms of the park, commercial and legal department, training centre, household facilities and social services. The park has an opportunity to use the laboratories, library and computer communications of the University.

The core of the park is an innovative business incubator in which the scientist after a thorough examination of his design gets an opportunity of preferential rent of premises and equipment, business consulting, financial, informational and organizational support. Thus, independent firms begin to operate in the park legally and economically.

The Argentine Republic

The state system of Argentina in the field of science, technology and innovation is defined by the Law № 25.467 of September 20, 2001, and the Law № 23.877 «Promotion and development of innovative technologies» of October 25, 1990.

The goal of the state policy in this sphere is to establish a general framework that would have structured, encouraged, promoted activities in the field of science, technology and innovation in order to facilitate growth of public domain in matters of culture, education, social and economic sciences, thus strengthening national identity, creating jobs and preserving the environment.

In accordance with Art. 3 of the Law № 25.467 from 09/20/01 established the principles of indisputable character and universal application in all areas of science, technology and innovation.

Following the Decree № 1273/96, was created the Cabinet for Science and Technology (GACTEC) chaired by the chief of cabinet. It consists of:

- Minister of Science, Technology and Innovative Production;

- Minister of Defence;
- Minister of Labor, Employment and Social Security;
- Minister of Education;
- Minister of Foreign Affairs, International Trade and Worship;
- Minister of Health;
- Minister of Social Development;
- Secretariat of State for Agriculture and Livestock.

Executive Secretariat of Technology, Science and Production Innovation is subordinate to the Ministry of Education of Science, Technology and Innovative Production. The competence of this Cabinet include defining policy priorities and ensuring budgetary means for science and technology of the public sector in order to facilitate economic growth and well-being of the population, improving education and health care, environmental protection and national defence.

The development of innovative strategy

When developing "The National Plan for 2005 -2015 in the field of science, technology and innovation ", were gathered 14 Commissions on the following topics:

1. Social problems: citizens and quality of life and work.

2. Environment and natural resources: environment, minerals and water resources.

3. Industry sector: agriculture and food industry, high-tech industry, transport and tourism.

4. Advanced technologies: biotechnology, nanotechnology, information and communication technology.

Brazil

Traditionally, in Brazil the coordination and control of the training of scientists and university professors is assigned to the state fund, Coordinating Office for the Advancement of Higher Education (CAPES *), which operates under the Ministry of Education, and the National Council for Scientific and Technological Development (CNPq **) under the Ministry of Science and Technology. Both institutions were founded in 1951, and over time of its existence made a significant contribution to the development of higher education, training for the national science and implementation of outstanding scientific and technological projects, such as in nuclear energy, the aerospace industry, agriculture and the like.

In addition, CAPES, in close cooperation with the National Council of Science and Technology, is working on the selection and directing the young teachers, graduate students, doctors for the training and professional development. The number of such professionals, according to statistics, is growing from year to year. For example, if in 1996, CAPES had tested 1,083 faculty-training programs for master's degrees and 541 programs on training doctors; in 2007, these figures have doubled. This, in turn, allowed significant increase in the number of scientists and teachers with advanced degrees.

In particular, if the number of graduates, masters and doctors in 1996 was respectively 42 and 21 thousand, in 2004 this figure has tripled.

The supreme governing body of the CNPq is the CNPq Council, which includes its president and vice president, president of the financing of training and projects (Finep) - a special financial body under the Ministry of Science and Technology of Brazil, and President of the National program of postgraduate training in higher education, Ministry of Education of Brazil. In addition, members of the Board are the Executive Secretary of the Ministry of Science and Technology of Brazil, and 14 representatives of the most prestigious universities, research institutions, industrial enterprises and businesses, which enables the country to improve its own competitiveness among the world's leading markets.

In the structure of research funding, at the first place are applied and exact sciences, among which are the engineering and computer science - 36%, at the second place are the natural sciences: agriculture, biology, medicine - 35%, the third place is belongs to the humanitarian sections of human knowledge : social sciences, language, art, etc. - 21%.

Geography of the countries in which the Brazilian scholars, scientists are studying and doing research, have been remaining almost unchanged over entire period of existence of CNPq, and can be represented as follows: the US accounts for 35%, Great Britain - 15%, France - 12%, Germany - 12% Canada - 7%, Spain - 5% of the total number of fellows studying abroad.

3.2.Innovative aspects of higher education in certain countries of Europe, Asia and America

3.2.1. General principles of Higher Education system of European countries

The education system of the country, as well as the culture of its people is a unique phenomenon, much more complex than other systems (transport, communication, security), because it is deeply connected with the spiritual and material aspects of the past and present. With this in mind, education and its organization have their own characteristics in each country due to the historical development and own national character. However, the most powerful agents of change in the education system do not appear to be its own problems or difficulties (systemic factors), but those outside of it. First of all, the priorities and requirements for the training and education due to the inclusion of the country into the general aspiration of the international community to the future, changes in production, culture and behaviour. Therefore, the reform of higher education, on the one hand, take into account the priorities of preserving cultural diversity of national education systems, and on the other - the challenge of improving international cooperation, mobility, employment of students in the European or international community, the international competitiveness of higher education institutions. [13] Either way, a new type of student and the future scholar is formed corresponding to the requirements of modernity.

The structure of the global higher education turned out to be extremely diverse, but dominated by two trends:

1.Unitary or a single system where higher education is provided by universities and their respective institutions

These institutions offer both general academic degrees and professionally oriented programs of varying lengths and levels. In the unitary system of higher education, it only consists of universities (the share of other high schools makes a small percentage). Such is education in Italy, Spain, Austria, Finland and Sweden.

Some experts identify a separate group of countries with so-called "integrated" universities, which include specialized secondary and higher education institutions (Sweden and Spain), and the countries formerly belonging to the socialist camp.

2.Binary, or dual system with a *traditional university sector*, which one way or another relies on the concept of Humboldt University and private *non-university higher education sector,* which has a well-defined structure. This education system is inherent in most developed countries, where, along with the university sector, there are numerous specialized agencies, admitting a considerable part of young people. Of the European countries, the binary system of higher education exists in Belgium, Great Britain, Greece, Denmark, Ireland, Netherlands, Norway, Germany, France, Switzerland and a number of other counties.

The trend of improvement and expansion of the "shortened and professionalized" higher education is quite effective for the world of higher education. We are not talking about equivalents of our technical colleges but about intensive training in an actual university (there are often special units of the university), but over a shorter period, up to three years. If organization is good (for example recently created "university institutes" in France), graduates receive a solid education, and as a result easily find a job.

Trends towards a comprehensive (unified) university system, along with the development of a strong higher education sector of non-university level contributed to a broad interpretation of the term "university", which differs from the one traditionally used in the continental European university - the establishment of intensive cooperation and harmonization between teaching, learning and success therein, which emphasizes personal education.

This trend is clearly observed today in the universities of those countries that have deeply involved themselves in the process of creating an information society.

Until recently, semi-structured higher education systems served fairly limited number of tasks to preserve and strengthen the country's government agencies, scientific and technological research with a simultaneous training of scientists, as well as providing the economy with highly qualified specialists. In most countries, these tasks performed institutions of higher education through the use of mono-disciplinary or lesser-disciplinary training. If higher education was general, the professional training was transferred to workplaces (a classic example is Japan).

The main tasks of the organization of educational institutions of higher education, which have professionally oriented courses in parallel with the university sector, are almost identical in most countries:

- Offer professionally oriented and cost effective types of education to meet the needs of the labour market;

- To ensure the needs of a growing number of applicants without a substantial increase in government spending on higher education;

- First of all, offer programs focused on teaching, which partly use applied research;

- Upgrading and improving existing vocational oriented education.

Along with the increasing diversification of the structure of higher education, takes place parallel diversification of degrees and qualifications issued by various education institutions.

There is the traditional differentiation between the structure of "continental European" degree with long enough academically integrated education, and the structure of the "Anglo-American" university degree with shorter in duration study for obtaining first degree, and a variety of post-bachelor studies, partly based on a modular system.

In some countries, short-cycle types of degrees are introduced in the national degree structure (e.g., in Denmark, Finland, Italy and Portugal). In other countries, such a system is introduced along with the traditional step-structure (for example, in Germany and the Netherlands).

In the non-university sector also takes place continuous diversification of qualifications. To comply with the requirements of the labour market, in certain professional fields were introduced a large number of new programs for a bachelor's degree, a number of post-baccalaureate courses. They can be completed by obtaining national degree or degree with dual specialization. Educational institutions of non-university type, not eligible for master's programs, can voluntarily collaborate with foreign institutions that are eligible for them. Thus, these educational institutions are able to offer international master's programs to their students.

Higher education institutions of non-university sector do not provide doctoral degrees, but this does not mean that the doctoral candidates from the non-university sector cannot study there.

In some countries, such candidates are able to obtain access to doctoral (PhD) program at the university immediately (e.g., Norway and the Netherlands) or through so-called training courses (e.g., Austria and Germany). In Norway, a few institutions of non-university sector acquire the right to conduct research studies and provide doctoral degrees.

Growing diversification is generally considered a positive development for the systems of higher education, both within each country and in the international context. However, growing diversification faces both problems of lack of transparency of qualifications frameworks of individual countries and the difficulties in the mutual recognition of qualifications because of the large number of different levels and variations in the content of qualifications. Solving these problems would encourage the search for other tools that would contribute to the understanding of the information received about the qualification.

Therefore, we will try briefly describing main trends in higher education systems in some European countries, the USA and Asia, illustrating the current state and the national system of qualifications in higher education. We will draw attention to aspects of mobility, transparency, in particular, system of credits and recognition of educational levels, guarantee (assurance) of quality, tuition fees and some of the practical aspects of (the structure and organization of the academic year, foreign students and career guidance system).

3.2.2. Innovative aspects of higher education in certain countries

Higher Education of Great Britain

Formation of the higher education system. *For several centuries, all of higher education of the country represented the founded in XII-XIII centuries universities in Oxford and Cambridge, established for education of the elites. Only in the XX century, the status of universities received colleges that prepared young people for taking final exams at the University of London. Higher education of the country was elitist and covered a very small percentage of youth. However, after World War II, the number of universities has doubled.*

For almost a century, the system of higher education in the UK had a binary structure. However, with the provision of technical institutes with university status in 1992, these two subdivisions of higher education merged. Therefore, British universities have a high level of autonomy. The general management of higher education carries out the Ministry of Education and Science, which implements this policy through councils of university foundations in England, Scotland and Wales.

Modern principles of higher education. Educational institutions. All universities in the UK have a high level of autonomy in the definition of courses, programs and teaching methods. Mediating between the government and the universities are assigned to the three councils of university funds (England, Scotland and Wales).These councils consist of representatives of higher educational institutions of the region, schools and lyceums, employers. Such broad representation allows combining objectives of the state and the interests of the university, quite objectively assessing the latter. Enrolled in a University students first try to obtain the first degree qualifications - Bachelor's degree, which is available in 2-3 years at the humanities, natural or teaching specialty, in 3-4 years at architectural, engineering and management specialities, in 5- 6 years at veterinary medicine and medicine.

Having qualified undergraduate student has the right to continue their studies for a master's degree. This requires 2-3 years of teaching, learning or research with sufficiently profound study of one or a group of related disciplines. In the country, there is no uniform sample of diploma of education. The only valid here are defended degrees of "Bachelor", "Master", and "doctor".

British universities are major scientific and educational complexes including colleges, masters and doctoral schools, research institutes, research centres, observatories and others.

Numerous technical and other colleges, programs of which have a clear professional orientation, provide postgraduate education of *non-university level.*

Many of them are subordinated to The Business and Technician Education Council (BTEC). First-degree BTEC diploma can be obtained after one year of full-time study, the national BTEC diploma - after 2-3 years. They are slightly different in rigor of admission requirements.

Recognition of professional qualifications is done, as a rule, by certain associations that set very strict requirements (for the majority of regulated professions). For their fulfilment university graduates are required years of work and self-improvement.

Access of citizens to education.The duration of secondary education is 13 years, the last two of which are dedicated to in-depth study of those subjects that the pupil plans to choose to study at universities. Schools provide the opportunity to choose courses of different difficulty levels, which leads to non-equivalence of certificates. The right to enter university without examination provides a certificate of general education of advanced level (abbreviated «A level»).At a high level of autonomy of schools in the educational process, the resulting requirements are standardized, as several independent examination boards take final exams. Most university students have A-level in three disciplines.

In higher education, the UK is dominated by universities, especially London, Cambridge and Oxford. British universities mainly have a humanitarian orientation. Students acquire technical specialties in university colleges, technical faculties of universities, as well as in special institutions, which are not part of the university.

To enrol prospective students submit their applications to Universities and Colleges Admission Service (UCAS), specifying up to five desired institutions in the application form. Documents are sent to universities that decide whether the candidate is worthy of admission. Although the country adheres to the open policy of higher education, the authorities concerned set a quota of seats (Secretary of State for Education - for teachers, Department of Health - for doctors, etc.). If the number of applications exceeds the quota or number of seats in classrooms, selection is used, the forms of which are determined by the universities. Bodies of allocation of funds and resources are also entitled to quota arrangement.

Three universities *(Oxford, Cambridge, and Durham)* hold competitive entrance examinations for students.

Academic Year and exams.Education begins on September 1 and officially ends on August 30, but in fact, the academic year is shorter. Every university is autonomous in the planning of the academic year, subject to the general criteria: the end of classes in June, a few (3-5) weeks break for main religious holidays.

Therefore, the academic year is divided into three parts, but in the last trimester, most universities reduce the number of training hours to provide time for students to review the material and prepare for final examinations. Some universities have interim vacations (up to 8 weeks), as well as a time for self-study of students. However, all the more apparent becomes a trend towards a two-semester year with a vacation between semesters.

All universities are autonomous in establishing methods for the control of work and knowledge of students: the majority emphasizes the final exams, often takes place ongoing monitoring of students, taking into account its results when deciding on their transition to the next course or level. *After graduating from the program of the first cycle, the student can obtain following marks: First-class honours (Class 1), Second-class honours, upper division (Class 2, Division 1) with the right to continue studies in the second cycle, Second-class honours, lower division (Class 2, Division 2 or «two-two»), Third-class honours (Class 3).*

To move up from the first to the second level, one must satisfy a high enough academic requirements (bachelor's degree with honours) and demonstrate in-depth knowledge on the subject of specialization. This rule has an exception when a person without a diploma of the first level is accepted to the second level, in case of his or her extensive experience in the chosen specialty.

Qualifications. Most students choose courses that provide the first qualification (often referred to as «undergraduate degree»). This first degree requires an average of 3-4 years of study, with the exception of veterinary and human medicine (5-6 years). The introduction of a shorter duration courses (accelerated) is expected, with the possibility of obtaining a first diploma in two years due to changes in the duration of the year, and intensive work. In the UK, the following qualifications are common: Bachelor of Arts (BA = Bachelor of Arts), Science (BSc = Bachelor of Science), Education (BEd - Bachelor of Education), Engineering (BEng - Bachelor of Engineering), Law (LLB = Bachelor of Law), Medicine (MB - Bachelor of Medicine). Qualification of Bachelor has three options "with distinction" depending on the amount of in-depth studied and passed disciplines: Honours degree 1, Joint

Honours degree - 2, Combined Honours degree - three (or more) subjects.

Obtaining an "ordinary" (Ordinary Pass degree) Bachelor's qualification with not in-depth study and mastery of the disciplines of the program is less prestigious.

Upon completion of training of the first level, a student can continue his education to obtain a higher qualification (postgraduate degree), which is often called the "master". The most common options are Master of Arts (MA = Master of Arts), Science (Msc = Master of Science), Business and Management (MBA-Master of Business Administration), Law (LLM - Master of Law). Obtaining this diploma opens the door to the study of the doctoral level with assignment of the degree of "Doctor of Philosophy» (PhD = D Phil = Doctor of Philosophy), less often - "Master of Philosophy". Occasionally, and only subject to appropriate independent research, doctoral title can be conferred immediately after the bachelor. Some universities confer qualifications of "bachelor" after completion of the program of the second level (B. of Philosophy orB. of Literature).

Training of foreign students.The UK remains one of the most attractive places of study for foreign students. One country cannot satisfy all requests, so admission to universities goes through a rigorous selection process. To increase chances of admission to university, a foreign applicant must apply to the reception (UCAS) in the autumn of the year before the beginning of training course. *A well-known source of information is the department of the British Council (British Council). Foreign applicant must file a document confirming his secondary education, which gives access to the university, and the accompanying paper.* It is worth paying attention to preparing for the interview, which determines the outcome of the selection procedure.

Applicants from the European Union, as well as the British, should send requests to the reception in the universities and colleges (UCAS) until December 15, and the entrants in the art institutions - in a reception centre for art and design (ADAR). Even with absence of formal restrictions on admission, there is still a strict selection of candidates.

In case of entrance of the applicant to study at the second cycle of higher education or doctoral degree, the applicant must apply directly to the desired higher education institution for sample request form and necessary information on procedural matters.

Scotland has its own organization for servicing of foreign students, which, in addition to language courses, organizes training programs of varying duration to improve knowledge of applicants to the level required to study in one of the 13 Scottish universities.

Schools set their own tuition fees, but in order of the State Control, Secretary of State for Education sets an upper limit, which is prohibited to exceed.

Foreigners can obtain information about possible grants and other forms of financial assistance at the offices of the British Council in their own country.

Higher Education of Spain

Formation of the system of higher education. Educational Institutions. The higher education system in Spain is extremely homogeneous, since up to 98% of students study at the universities, out of which they only train experts in tourism, crafts and some other occupations. 7 out of 52 universities are private. Most universities have classic set of training programs, but there are several polytechnics, as well as the Open University of distance learning.

Universities have a fairly complex structure and offer courses, programs and qualifications at various levels. Thus, the departments (Facultad Universitarid) provide programs lasting 4-5 years, issuing a full diploma (Licenciadd). Higher technical schools (Escuela Tecnica Superior) issue diplomas of senior engineers after 4-5 years of study. University (Escuela Univers) and engineering (Escuela Tecnica de Ingeneria) schools issue diplomas after three years of study.

The university sector of higher education includes institutions that provide two types of diplomas: equivalent to a university de-

gree Diplomado or Liceciado provided that the student completes programs similar to university (A) and a degree lower than a university degree after completion of simpler programs of art specialties (B).

Diploma A offer Military Academy, the Institute of Tourism, Civil Aviation and theological institutions (not all of them are subordinate to the Ministry of Education and Science). Diploma B offer institutions and vocational schools with less stringent conditions of entry and simple programs (music, singing, design and other artistic specialties).

Teaching staff of universities in Spain is divided into four categories: professor, acting professor, deputy professor, teaching assistant. Professor should have a doctoral degree, teach and conduct research. The following two categories, too, must have the title of a doctor, but for assistant teachers, it is sufficient to have complete university degree or degree of equivalent higher education institution. However, to obtain a work permit, they must additionally pass a professional exam. Government and University Council are making great efforts to encourage teachers to improve their academic and professional level (internships abroad, refresher courses, etc.).

Access of citizens to education. Formed autonomy of universities gives them the right, if necessary, to introduce additional requirements in addition to general. Entry examinations are composed of two tests, introduced by the examination committee for the entire territory of Spain. The first test is aimed at examining general skills of the applicant (culture, language, capacity for analysis and synthesis, etc), the second - mastering of those subjects that have been studied in depth at orientation courses.

Competition takes into account certificate marks, final exams for the "orientation course" and the two tests. A certain number of young people, who studied for five years at secondary technical schools and received diplomas of technicians, may also enrol in universities along with the graduates of the orientation courses for the relevant diploma specialization.

There are specific conditions for admission of individuals older than 25 years, who have to pass two specific tests. On admission, they commission takes into consideration their work and general experience and so on.

Provincial-territorial division of the country affected the contingent priorities: 95% of the seats in institutions of higher education located in a particular province are granted to residents of the same area, 5% of seats- to those, arrived from other places.

The level system of education.The three-year study at the university schools provide qualification of technical engineer with the right to continue education in the second cycle of the same university or enter the labour market.

The five-year training in the faculties of the universities or in their higher schools (and in some institutes) allows the student to receive a degree Licenciado, which gives him the right to postgraduate studies.

Following the instructions of the University Council, universities have increased the number of courses in almost three times. There should be mentioned introduction of a master's program with the degree of Magister Universitario, duration of which is 600 hours in 1-2 years, which objective is to increase professional skills of graduate students, and provide them with skills of scientific analysis and research. Another new option of postgraduate training enables the acquisition of a specialist diploma *(Especialista).*

Completion of the first two university cycles and obtaining Licenciado gives the student the right to continue his studies to obtain a diploma of the doctor. It lasts two or three years under the supervision of the scientific adviser, accompanied by an individual research, writing and defence of a thesis.

Qualifications.In Spain, compulsory secondary education consists of 10 years study and enables a "successful" student to receive Craduado Escolar with the right to continue his education in secondary school of higher level (two classes with granting of Bachelor of one of the four specialities and one year of "university orientation course"), and the right to participate in competitive examinations in the universities. “Unsuccessful” student receives a Certificate de Escolaridad, which gives him access only to the two-level vocational education (5 years altogether) with obtaining a diploma of a technician and the possible (competitive) entry to specialized schools.

Organization of education, academic year and examinations. The school year begins in the first week of October and ends in June, with short vacations during major religious holidays. A week has 20-30 class hours, which amounts in 600-700 hours per academic year. After completing subjects’ study, student passes examination (in February, June or September).

In Spain, there is a ten-point system of assessment: 10 - matricula de honor, 9-9.9 - sobresaliente, 7-8.9 - notable, 5-6.9 - aprobado, below 5 - suspense. Passing mark is aprobado. Theses are assessed by three levels: extraordinario, apto cum laude, apto.

The learning process in the faculties and higher schools of universities is organized by three cycles: Basic (2-3 years), specialized (2 years with obtaining a diploma), research (2-3 years with obtaining doctorate degree). University schools have only 3-year course of study with a high level of specialization of study programs for improved professional training. In this way are trained primary school teachers, social workers and the like.

Universities form the curricula according to three types of subjects: compulsory for all universities, issuing certain degree (academic qualifications); training courses of high schools’ choice, which may be either mandatory or optional; training courses of students’ choice (10% of total study time).

In Spain, only 20% of students receive financial support from the state or provincial authorities.

Training of foreign students. Candidates for entry into Spanish universities must take the first steps for a year before the start of training, through contacting an Embassy or Department of the Institute of Spanish culture in their respective countries.

To enrol in the first cycle of university degree programs, candidates must have a high school diploma, valid in the country of origin for university entry, and recognized in Spain as well as to pass a language test (conducted in June or September) and competitive examinations. For foreigners, 5% seats in institutions of higher education are reserved. Citizens of EU countries enter the universities on the same conditions as Spanish nationals. In recent years, language examinations are also carried out by embassies.

Applicants can master following cycles of training programs and master's or specialist degrees if their educational qualifications are sufficient for recognition in Spain. Conditions of admission and programs for the acquisition of doctoral degrees can be found in the handbook of the University Council.

The country has signed many international conventions and bilateral agreements on mutual recognition of diplomas, which can be found in its embassies. Foreign applicants pass the examinations on equal grounds with the citizens of Spain (general test and test of in-depth knowledge of specific courses of study at a university).

The determining factor is knowledge of English, since most of the classes conducted in this language. For foreigners, universities organize language courses of varying duration. In some provinces, which have their own official language, some lectures on specific subjects can be conducted in that language.

It is necessary to send a request directly to the chosen university or college. The final date of submission of a complete set of documents are not constant in all institutions, but the admission of foreigners for training takes place in June or in September.

High schools and the university council set the tuition fees for each academic year. It is quite high - almost 1,200 euros in state universities and in private schools, it is 5-6 times higher. Foreign students can receive grants for their education from the Spanish Government providing there are adequate international agreements on financial assistance for students. The most often this source is used for doctoral studies.

Citizens of Western Europe can receive grants for education in Spain within the framework of the aforementioned programs to support mobility across the continent.

Higher education of Italy

Formation of the system of higher education.Higher education in Italy has the exaggerated university and small non-university sectors, and the majority of schools are public.

Universities with educational and scientific programs are managed by the Ministry of Universities and Scientific and Technological Research, which aims: to plan and implement the development of scientific research; draft a three-year development plans for universities, to distribute funds among institutions according to law; coordinate the participation of Italy in international programs.

In total in Italy there are 65 university-level institutions (public and "free", self-managed, but with the official recognition of diplomas and functioning in accordance with public programs under inspection of the Ministry of Education).

Non-university institutions are classified as follows: a) Art Institutes under the auspices of the Inspectorate of art education; b) institutions under the auspices of other ministries.

Access of citizens to education. Admission is determined by secondary school certificate (Maturita exam). The remaining pre-conditions depend on the choice of the course. Universities are free to establish requirements and the number of seats for applicants. Many of them conduct an entrance exam, and make a school diploma assessment.

While most courses are open to all, some (medicine, dentistry) have defined or variable from year to year number of vacancies. Admission to limited specialties takes place only according to the results of examinations. In the private universities, there are also limits of seats.

Access to the diploma of specialization also takes place through competitive examinations (oral or written test with assessment of achieved qualification). Candidates are admitted for training according to the received after the exams qualifying list.

Admission to the doctoral program after graduation is also done through competitive examinations (written or oral test). Exams are organized at the national level; each course (program) has a certain number of seats.

Organization of education, academic year and examinations. Traditionally, the year begins on November 1 and ends on August 31 next year. Lately, the school year in many departments has been divided into two semesters, and begun earlier.

The programs are generally divided into separate classes (disciplines) oral exams after their completion. Each school year ends with a certain number of exams. Passing marks range between 18/30 and 30/30. The scale consists of 30 points; therefore, the examination board consists of three persons, each of which can assess a pupil of 10 points maximum.

Number of annual examinations depends on the faculty. There is also a list of required subjects and exams, part of which is comprised according to the student's choice and approved by the *Consiglio di Laurea. Upon completion of training the student must pass the final exam esame di laurea by written thesis or project (tesi di laurea), which are defended before the group of 11 teachers (so the total mark can consist of points).*Attendance is necessary during graduation specialization. For admission to training in the next year, student passes exams on theory and practice of the chosen specialization at the end of the previous year.The final exam includes a written thesis on one or more subjects relevant to training programs.

Graduate students studying for a doctorate should report annually on the amount of work performed for permission to continue their education. After graduation, they defend the thesis (dissertation) before the National Commission.

The teaching staffs at universities constitute:

a) Full or associate professors, who enjoy equal rights and independence;

b) Researchers, expanding a field of research and assisting in the teaching of official courses;

c) Professors on short-term contracts, which also help to teach formal subjects (1/10 of the amount of all teachers);

d) Language teachers (lettori di madre lingua) at the courses where cannot be more than 150 people.

Qualifications.Italian universities that admit 13-year-old high school students, issue only four types of diplomas:

1. *Diploma universitario* – recognition of standard short cycles lasting 2-3 years at universities and so-called scoule dirette afini speciali, to be converted into a future complete "graduation" courses.

2. Diploma di laurea– full diploma after 4-6 years of common cultural and scientific studies, which grants the right to a title of *«dottore».* Representatives of the regulated professions (doctors, architects etc.) must pass a state professional exam to begin their professional career. For most professions training lasts 4 years, it lasts 5 years for engineering, architecture, dentistry, and 6 years for medicine.

3. *Diploma di specializzazione* — vocational qualification of a specialist, after 1-2 years of additional training by programs that define the universities themselves (the training of lyceums teachers, etc.).

4. *Dottorato di ricerca*(Ph.D.) — introduced from 1980, the title of doctor of scientific research, undertaken under the supervision and on the decision of Collegio dei docenti in the discipline. Studies lasting 3-5 years enable graduate to perform separate research with the original results.

Training of foreign students.A candidate for studies in Italy should take appropriate steps a year before the beginning of his chosen classes, contacting the nearest embassy (consulate) of Italy. Information about the education system and conditions of admission can be obtained through the database ORTELIUS, and by applying to Ministry of Education, universities and other higher education institutions in the National Academic Recognition Information Centre CIMEA (Italian NARIC), and from directories of the individual departments, containing details about courses. Vacancies for foreigners are reserved in higher education institutions with a free-entry, as well as the ones with the entry through competitive examinations.

To qualify for a full degree, it is necessary to have at least 12 years of secondary education and a certificate recognized in Italy, as well as to pass the exam on the Italian language, which each institution conducts for itself. A set of documents must get to the nearest consulate of Italy until 15th of April. A prospective student specifies the desired department, as well as the second choice. If there is stipulated a competitive examination system, the foreigners are passing the exams together with pupils of Italy.

Recognition of foreign qualifications.Italy, a member of most of the international conventions on the recognition of the Council of Europe and UNESCO, recognizes and accepts international and European baccalaureate.

Agreements with France, Belgium and Spain provide automatic mutual recognition of certificates that give access to universities. With France and Spain already takes place transfer of credits. Italy signed a bilateral agreement on the recognition of diplomas from universities of France, Germany and Spain.

University seats are provided as follows:

1) To citizens of the European Union;

2) To citizens from developing countries;

3) To citizens from countries without a higher education or to those where there is no desired program of study.

Doctoral courses have a limited number of seats, so all candidates are required to take an entrance exam. Foreigners are offered up to 50% of the available seats. Registration of queries takes place through the Italian diplomatic services. Admission to Scuole dirette a fini speciali also requires entrance exams. Educational institutions may set their requirements and carry out selection. Making requests takes place through embassies.

Tuition fees.Each university sets tuition fees for itself, focusing on several criteria such as family income and student achievements. At that, minimum is set at about 200 euros, maximum - no more than 600 euros per month (the amount increases in proportion to inflation). The fee in private schools is much higher.

Higher education of Germany

Formation of the system of higher education. One of the oldest universities in Germany was established in 1385 (Heidelberg), and was created in accordance with the Paris model by which the emperor or the pope granted the right to a corporation of teachers and students to study theology, law, medicine and philosophy. By the end of the XVII century, about 40 universities trained government officials.

The new stage of reform of higher education began on the creation of exemplary university in Berlin (in the 1809/10 biennium), and is associated with the name of Wilhelm von Humboldt, who for some time supervised education in the government of Prussia. At the core of this university, he laid down the principles of broad autonomy with public funding, self-government of departments (Ordinaries), the emphasis on free research without a narrow practical specialization, difference of university education from the school and from strictly professional training.

All this became the basis of academic freedom for professors, and a combination of science and learning for students, as well as the beginning of the creation of technical universities. During the reform of the education system after World War II, the higher professional schools, diplomas of which have only recently come close to the university level, have moved into the category of higher education institutions.

The concept of a traditional German university is based on neo humanistic theory of von Humboldt, according to which the University is a centre of the development and promotion of knowledge, training of qualified personnel.

Today, higher education of Germany is characterized by the interaction of the federal government and Länder governments: they regularly gather Conference of Ministers of Education of the regional states, there is also a Union of Rectors. The majority of serious documents they create together. Also, there was established a commission on scientific planning. High schools are funded by

Länder governments at 94%, by the centre - 6% (1993). Approximately 7.8% of the funding of university research is carried out by the private sector of the economy.

Today, the German education system can be schematically represented as follows: elementary school (4 years) - High School (8-years of technical school or 9-years of high school) - High School (universities, pedagogical institution, School of Art and higher technical educational institution).

Modern principles of higher education. Educational institutions. After unification in the 1992/93 academic year in Germany were 318 higher education institutions of different levels: 91 ordinary and one general education universities, 11 pedagogical, 19 theological, 43 art and 153 technical and specialized universities. The private sector included six of the mentioned universities, 17 theological institutions, two art colleges, 35 higher vocational schools.

All higher education institutions are divided into the following groups:

- *Universities* (classic, technical, general and specialized university-level institutions - higher pedagogical, theological and medical schools). Most universities have a classical structure. They also train doctors;
- Higher professional schools*with specialized professional training, prepare specialists in engineering, business, management*;
- High schools (colleges) of Art and Music.

The basis higher education system is universities. They usually have a classical structure and tasks: they are responsible for research, education, training of highly qualified personnel, and training of doctors. They have the right to award Habilitation (doctorate-2) to replace heads of the department Training lasts at least four years.

Pedagogical high schools train teachers for lower levels of education and specialized schools. Higher professional schools play an important role in preparing specialists in engineering, business, management, etc; research in them is limited and they do not pretend to be fundamental.

Music and art higher education institutions train specialists of all kinds of arts and music, including musicology, art history and more.

***Access of citizens to education**. For admission to institutions of higher education it is necessary to have a secondary school education, which can be of three types: "general" (entitles the admission to all universities); "Professional" (gives the right to study specific specialties); certificate only for entry to higher professional schools or the relevant department of general education university.*

The first two are issued after graduating from gymnasium or respective vocational training institution with duration of studies of 13 years. Third is obtained after 12 years' training in the professional schools. Music, art and sport institutions hold professional examinations.

For some specialities of higher engineering education, applicants are required a certain work experience in production. There is also the possibility of admission to universities without a formal certificate based on competitive examinations and mandatory specific work experience in this specialty.

Studies in state educational institutions are free (except for dormitory fees, use of sports facilities and so on). For poorer category of students is assigned state grant for a certain time, half of which must be returned over time.

Organization of education, academic year and examinations. The duration of study in the universities traditionally is 12 semesters, in some cases - 8 semesters. The learning process in high school is divided into two (main and primary) stages. The first, main stage covers 4 semesters, consists of obligatory subjects and includes a final regular examination (the transition to the second stage). The second, primary stage covers 4-6 semesters, gives students a wider choice of subjects and examinations and ends with the issuance of a master's degree or state exam. The transition to the second stage makes it possible to change the subject of studies to some extent.

Each subject is also concluded by exams. After completing the program, students submit written tests and pass oral and written exams on the basic disciplines. Knowledge of students is assessed according to a 6-point scale: very good (1); Good (2); Satisfactory (3); sufficient (4); insufficient (5); unsatisfactory (6).

During training process, students are engaged in various types of activities: lectures, seminars, examinations, workshops and excursions. During seminars and practical tests, oral or written work is required, for which the student receives a coursework certificate needed during both the final exam, and the transition to the next level of studies. It is the main way to control the quality of education throughout the school year. The involvement of senior students into various types of tutor activities with younger students (paid) is also expanding.

There are four categories of teachers: professor, assistant, research worker and associate of special subjects (foreign languages, sports, etc.). Doctors perform functions of the first two, but the professor must have considerable experience and to be elected through the national contest. Scientific worker should have higher education, to carry out research and conduct workshops with students. The entire teaching staff has the status of civil servants.

University teachers spend on scientific research about 1/3 of working time, their counterparts from higher vocational schools have twice-higher weekly lecture load, so they have less opportunities for research.

The level system of education. Graduates are awarded the title of Certified Specialist after passing the state exam, and in universities - Masters' degree, which gives them the right to the public service, the relevant professional activities and postgraduate studies.Masters are focused on teaching. Highest qualification in Germany is the title of doctor. It requires 3-5 years of scientific research, passing the state exam and thesis defence.

Qualifications*.* Category of the final document (diploma or master thesis) depends on the type of program (specialization). Courses of engineering, economics, social and natural sciences end in obtaining a diploma, art and humanities - the master's work. Diploma *or master certificate is issued after 1-2 years of ad-*

ditional advanced training, which takes place after mastering the second cycle of the program.

Training of foreign students*. To study at the university level, one should make request a year before the study. One needs to apply for introductory information for admission to the German Embassy, Academic Exchange Service DAAD, or Goethe Institute.* For admission to the University, one needs a National Certificate of Secondary Education that gives the right to receive a university education. With regard to its recognition, one should contact the institution of interest. Documents recognition is based on the recommendations of the Standing Conference of Rectors of German universities. In case the candidacy acceptance, the applicant must meet all requirements listed in the letter received from the university.

Education in Germany takes place in German, so its knowledge is mandatory (since 1996, to test the language proficiency was introduced the new test DSH).

Germany has signed Core conventions of Council of Europe and UNESCO on recognition of foreign qualifications. The country has signed bilateral agreements with all its neighbours.

Provided that certificate is insufficient, the applicant passes a special test (Feststellungsprufung) and a language test. The *most often testing is carried out upon completion of two semesters' program in special Studienkollegs. Studies in these colleges are not mandatory but recommended for those who choose to pursue higher education in Germany.*

Higher Education of Poland

Formation of the system of higher education. The first university in Krakow was founded already in 1364. During the heyday of the country in XVI-XVII centuries, universities were opened in Vilno (1578) and Lvov (1661 p.), which then belonged to Poland.

Warsaw University operates from 1816, Polytechnic Institute - from 1826. The two periods of quite significant development of higher education were post-war years of the XX century, although the first time the model of education was German, and the second time - Soviet. Under the socialist system, the state higher education was free. To the private sector belonged Catholic University of Lublin, which was perhaps the only major non-governmental educational institution throughout the former "Soviet bloc".

Political and social changes in the country, the introduction of a market economy led to the reform of higher education. Universities received a higher degree of autonomy, the right partly take students who pay their tuition fees; to diversify the list of specialties; there were established many private universities. Education in public institutions is free of charge within the limits for entering out of the competition.

In Poland, there are 11 public and 1 private universities of the classical model, 15 technical universities and 2 institutes, 6 academies of economics, 11 medical academies, 17 art schools and 6 institutions of higher education on physical education and sport. List of private higher education institutions has included 84, 9 of which were entitled to award the qualification of "Master".

Modern principles of higher education. Educational institutions. The higher education system manage Ministries, to which are subordinated the largest (public) institutions. With them collaborates Central Council for Higher Education, consisting of elected representatives of the universities and the scientific community (35 professors, 10 teachers and 5 students), which the law has provided with considerable supervisory rights. Indeed, no budget funds are allocated and no ministerial decrees are issued without their consent.

The structure of higher education in Poland include: universities (virtually autonomous in all matters of internal and external activities, including the introduction of new departments or specialties); polytechnics and higher technical universities, medical academies; agricultural academies; economic academies; higher educational schools; higher academy of arts (music, theatre, art, film); academy of physical education; maritime schools; theological academy; non-governmental and private institutions.

To university level of higher education (post-secondary education) belong numerous schools, technical schools, higher vocational schools with diplomas and certificates of an appropriate level (technician, preschool teacher, and others), not exceeding the diploma of secondary schools (matura) on the rights of admission to universities.

Poland adopted a six-point grading system; 3 (satisfactory) is a passing grade, 6 is the highest grade.

Access of citizens to education. Secondary education includes eight-year lowest and four-year level in the lyceums of general education, or a five-year level in professional schools. Certificate is called «swiadectwo dojrzalosci» (maturity certificate) or "Matura". Obtaining the certificate does not guarantee automatic admission to universities, which can set their own requirements and apply their methods of selection. In most cases, they take written and oral exams in secondary education, analyze school grades and conduct interviews for determining general development and abilities of prospective student. Professional testing is also carried out for future artists and athletes. Exceptions are the winners of a nationwide subject Olympiads, who enrol to the universities without entrance examinations. Foreigners, in addition to knowledge of the Polish language, should demonstrate the same knowledge as Polish citizens.

Organization of education, academic year and examinations. Studies begin on October 1 and end in June, with winter and spring semesters and examination sessions in February and June / July. Further examination is carried out in late September. Students of agricultural and technical colleges often have summer practical training. Intermediate exams are taken in the same way as it happens in Ukraine. Basic disciplines end with examinations, short courses and workshops — credit tests. At the end students take state examinations and defend a written independent work (thesis).

The entire training period is divided into cycles that end with the award of the corresponding qualifications. From the moment of transformation of higher education, students received a lot more opportunities for training on individual curricula. In order to create a solid base, for this form of training is planned to switch to a system of calculation a program execution through credits.

***Teachers**. Differentiation of teachers, their training, scientific and academic status, and competitive employment etc. in Poland are very similar to those in Ukraine. Only instead of the title "Doctor of Science" is used the title doktor habilitowany.*

"Licensee" and "engineer" are professional qualifications, the academic component of which is not sufficient for admission to doctoral studies. The right to the latter gives common in universities qualification of "Masters", the acquisition of which requires mainly five-year study in university-level institutions. Recent changes in the Polish education system have the ultimate goal of achieving international recognition of the "Masters'" degree

Admission to the doctoral program takes place on a competitive basis. During training, it is required to pass three exams (specialty, extra discipline and one of the most common foreign languages). Requirements for theses (dissertation), its verification and defence for both of the highest levels of the Polish higher education are about the same as in Ukraine for the candidate and doctoral dissertations. Rights and possibilities of holders of scientific titles are also similar to ours.

***Education of foreign students.** In the past, in the days of ultra-high-centralization of the state, the majority of applications to study in Poland went through the embassy, and a contingent of foreign students was formed mainly as a result of inter-state agreements and agreements on the exchange of students, or on admission to studies.*

The democratization of the early 90-ies was accompanied by substantial decentralization. Today, universities often carry out international contacts and projects outside the ministries. The new Poland is making considerable efforts to integrate and support its Diaspora.

Since in recent years it have been possible to find a lot of information about Polish educational institutions in international *publications and databases, it is recommended to send the request directly to the selected institution.*

Recognition of Foreign Qualifications. Poland *has signed almost all the European Conventions for the comparison and recognition of educational qualifications, has a large package of bilateral agreements, is one of the most active participants in new projects. Therefore, it tends to recognize those certificates, which give their holders the right to apply for admission to institutions of university level after 12-13 years of secondary education in the country of awarding them.* However, any application is considered individually, therefore the owners of certificates of lower rank have certain chances in case they have other positive qualities. In Poland are also recognized periods of higher education that begun abroad if the applicant has all the necessary proof of its successful completion.

Entrance examinations*. Higher education in Poland is almost completely open to foreign students, in case of appropriate payment for a training program and satisfaction of the above qualifications. Those who wish to study or continue their education in the arts and sports specializations are required to pass specific tests to demonstrate the appropriate skills, and (on demand) provide samples of his work.*

Language requirements. Sufficient *knowledge of the Polish language is a prerequisite for admission to the school. For admission and the start of training on the first cycle of Polish institutions of university level, successful learning at annual language courses and passing the final exam is usually sufficient.* Embassies and consulates can attest it. If language study is necessary, the candidate should apply to university or language centre in the city of Lodz, to prepare for exams and training at 20 hours a week 9 months' language course.

It is allowed to write and defend dissertations of the highest level in the most used foreign languages (English, German, French or Russian). Recently there have been more and more examples of the application of this rule for the master's thesis.

Admission to doctoral studies*. For doctoral studies, the candidate must apply to the Polish institution, which has the right to conduct them. Enrolment takes place on available vacancies, given the level of academic qualifications of the applicant, which must be not lower than Master in Poland.*

Higher education of Russia

Past and present of higher education*. For historical reasons, the oldest educational institutions of Russia were on the periphery the empire and the first school in the metropolitan territory date back to X-XI centuries (Pskov and Novgorod). Only in 1687 in Moscow was established higher education institution - the Slavic-Greek-Latin Academy.* The rapid development of higher education comes at a time of the reign of Peter I. Thanks to the invitation of a large number of teachers and scientists from Europe, over a short period (1701-1716), there were established several institutions of higher education (medical, artillery, navigation, marine, engineering, etc.). Moscow University, significantly ahead of other universities in the country, was organized by the efforts of M. Lomonosov in 1755.

Formation of the system of higher education. *In the XIX century in Russia was established centralized multi-tier education system, and its reform and expansion came to the second half of XIX- beginning of XX century, when in different cities of the empire emerged over a hundred of classical and technical universities and institutions of other profiles (military and educational institutions, etc.).*

Russia declared its independence in August 1991 It inherited a specific multi-level system of the USSR, the best period of which came to the first two decades after World War II, when it was part of the three best in the world, both in terms of coverage of youth and the content and quality of education. The main shortcomings of the Soviet system of education are associated with a combination of excessive centralization with extremist ideology, «residual» education funding and lack of attention to the support of teachers at all levels.

Since its inception, Russia declared the main focus of education policy democratization and de-politicization, reaching in this way obvious successes in the rapid development of private educational sector, activities of hundreds of independent publishers and the formation of the market of textbooks, as well as changes in the structure of education levels, aimed at eliminating inherited deficiencies and bringing the quality and content of education to recognized international and European standards.

In Russia, there are 541 civilian and 89 military universities; in the private sector of private and municipal licensed establishments - 225 universities, academies, institutes, colleges, so the total number of students in Russia has exceeded 3 million, with education in 89 areas for 400 specialties. Practically has been formed two-stage structure of higher education, has occurred redistribution of students with contingent growth at economic, and most of the humanitarian specialities. Secondary education and the system of admission to higher educational institutions have changed very little.

The legal framework for higher education has laid Education Act of 1996 and several presidential decrees.

Organization of education, academic year and examinations. As in secondary education, the academic year at the university begins on September 1. It is divided into two semesters (or 3 in some institutions), continuing until June with short breaks for holidays and between semesters. Weekly load per student is set at 52-54 hr., 24 of which account for lecture classes, dominated by lectures. In addition to lectures, are used more active forms of training - different kinds of seminars, practical and laboratory work, practice in manufacturing etc. Students have insufficient means and opportunities for independent work, as the amount of the state budget is insufficient. In order to finance higher education self-financing methods are used, for example, enrolment of the students paying for their studies, as well as private institutions attracting funds and sponsors, foreign aid - for example, the projects of the Soros Foundation (100 million USD) for the Internet access of universities of Russia.

Mastering basic disciplines finishes the exam or other type of testing. Grading: The highest mark is 5 (very good), 4 (good), 3 (satisfactory), which is enough for crediting subject, 2 (unsatisfactory), which does not allow to continue studies. Less substantial subjects may be assessed by two-point scale: "Passed" (teacher believes that the student has fulfilled the general requirements) and "Not passed" (student's work is unsatisfactory; the subject must be studied independently or repeated).

Soviet single-tiered structure of training in high school required training for 5 years (6 - for medical specialties) without intermediate stages; state exams, writing and defence of a thesis to obtain (if successful) a document entitled "diploma", which had both an academic (entitled admission to the doctoral studies) and professional (the right to perform certain work) qualifying contents. Five-year training programs remain transitional form of organization of studies at the university.

Already half of higher education institutions introduced a new structure that provides for a two-year basic higher education (30% for the natural sciences and mathematics, 25% - for humanitarian) to obtain an intermediate certificate of undergraduate education and the possibility of a partial change in the direction of education in the 2 year second cycle with a qualification of "bachelor", programs of which contain the average number of disciplines of specialization. If the number of the latter is greater, the qualification of "specialist" is awarded.

The best students can continue their education and become masters (the duration of higher education - at least 6 years) would open to them the way to doctoral studies, or to obtain the qualification of "specialist with advanced education" (duration of studies 5 years or more).

The final stage of the Russian education (postgraduate study) lasts 2-3 years under the supervision of scientific adviser and involves independent research, writing and defence of the thesis of certain level and volume. There is an ongoing debate about the feasibility of preserving the old title "candidate of sciences" or transition to international - "Doctor of Philosophy» (PhD). Longer research work and summarizing its effects in a greater in volume dissertation with the complex procedure of its defence leads to the highest academic title "Doctor of Science" with broad rights to personal autonomy in the studies, and getting higher positions in the academic hierarchy.

Professors. The structure of the academic staff of Russian universities consists of four categories of teachers: professors, associate professors, senior lecturers, lecturers. To obtain academic title "Professor" and the relevant diploma, one should have academic degree "Doctor of Science" (in exceptional cases, if there are recognized scientific achievements and long enough successful teaching practice, a candidate diploma is sufficient). The professor must lead the department or area of research and teach a profiling course (discipline). Associate Professor, PhD has to deliver lectures and supervise research work. Senior teacher has the right to deliver lectures and conduct other types of training; the assistant must obtain permission from management of the faculty to deliver lectures. All teaching positions are replaced by competition. Recently, there have been experiments on enrolment contract. The workload of classroom teachers in Russia significantly exceeds the standards of developed countries, ranging from 200-300 hours for professors to 800-900 for assistants.

Qualifications. Completion of secondary school (11 years) provides the qualification "certificate of maturity", vocational (12 years from its start) - Diploma of technician or junior specialist. Both entitle admission to Russian universities.

The old five-year higher education system provided only double the content of the qualification of "certified specialist", above which were degrees (titles) of candidate and doctor of sciences. The new structure provides four final qualifications, accordingly increasing in duration of training after school, planned to obtain them: Bachelor's (4), Master (5-6), PhD (8-9), PhD (over 12 years). Higher educational institutions can offer training programs of two levels: four years (specialist), five or more - a specialist with advanced education.

Recognition of Foreign Qualifications*. Russia has signed core conventions of the Council of Europe and UNESCO on the mutual recognition of diplomas, has bilateral agreements, information on the application of which provide Russian embassies and consulates. Attitude to foreign certificates of higher education is quite tolerant because in most other countries it is longer than in Russia. The second reason is that almost all candidates demonstrate their knowledge on important subjects of study in the universities during the annual period of language study and graduation exams in language and these disciplines.* Official qualification recognition authority is the Department of Licensing and Accreditation of the Ministry of Education. International Coordination Council of Educational Institutions and The Federal State Budgetary Institution «Centre of International Educational Activities (NGOs) are intermediate bodies between universities and foreign partners.

Education of foreign students. *Requirements to foreigners are the same as to the citizens of Russia, except in cases of interstate exchange, when the selection of candidates provides the partner country. Since almost all foreigners spend a year in a Russia on a language courses with simultaneous iterance of necessary subjects, final exams of these courses are equal to entrance exams to universities and other institutions of higher education.*

The education is in Russian with some exceptions. Foreigners are often trained at the 9-month language courses in Russian universities. After the first stage of language learning, the students also learn disciplines of chosen speciality of higher education at these courses. Formally, a foreigner must meet the same requirements as the Russian entrant.

To access the first cycle of higher education in Russia, the candidate must have a recognized in Russia certificate of completed secondary education, which gave him the right to enter the university of his country. Since the beginning of the 90s, the Russian government has introduced accessibility of its higher education to foreigners who can individually apply to the universities and their departments of foreign cooperation, and sign individual contracts for education in Russia without the prior consent of the Ministry of Education of Russia. The data on institutions and their programs can be found in embassies and consulates of Russia, as well as in reference brochures of European organizations (such as Student Handbook, published by the Council of Europe, or Study Abroad, publication of UNESCO). There are no quantitative restrictions on the admission of foreigners, except that they would be more than the number of available seats. For arriving at the training, it is necessary obtain a visa and pay the cost of the institution's annual program in advance.

Very often, on obtaining a Russian diploma, foreigners continue doctoral studies in the same university. For this, they must fulfil the same requirements as nationals of Russia and pay for their education until the moment of thesis defence and obtaining the scientific title of "candidate of sciences» (PhD). Foreigners rarely defend the next (doctoral) dissertation on the territory of Russia. Most often, they do it in their own country, and transfer the procedure of thesis defence in Russia, arriving by the due date. Tuition fees vary greatly in different institutions and regions of Russia, ranging from 1100-1600 to 6000 euros per academic year.

Student dormitories are designed for simultaneous stay in room of 2 to 3-4 people. The cost of hiring separate apartments outside of the campus is high. Medical services at public institutions are free of charge.

Higher education of France

Formation of the system of higher education. *In France, it is possible to obtain a higher education, having completed secondary, in 78 universities. 453 of universities, mainly mono-disciplinary are small (a few hundred) contingent of students*. 25% of students are studying in the private sector, which has five universities and most of 453 specialized institutions of higher education. About 2/3 of the students study in the country's public universities, almost every one of which is a large institution with a dozen or more thousand students, have administrative and academic council, board of teachers and students, managed by the president. Universities are the associations of "Units for Training and Research» (UFR = Unite de formation et de recheche) on the basic disciplines, headed by the elected directors, as well as more familiar to us Institutes and Schools (technological, political and legal studies, vocational training of teachers, general administration or management, tourism, communications, media, social and economic development, international relations, and many others). No wonder that only universities award more than ten different qualifications.

Access of citizens to education. *Part of the higher education is almost completely open (it is mostly universities) and admission is reduced to the simple entry for training and payment of a token amount for office expenses. Another part is "closed" (dominated by non-university institutions), as enrolment takes place in conditions of rigorous selection when there are several contenders per seat. Studying in the final class of the Lyceum ("terminal"), a student may apply to the council to resolve the question of accession to these institutions with selective admission based on submission:*

- Preparatory classes that intensively prepare for entry through hard competition to popular in France higher (or highest) Schools;

- Technological Institute for obtaining technological diploma after two years, which is first of all a professional qualification, favourable to success in the labour market;

- *Sections of higher technicians* with access to the certificate of "highest technician" after two years;

- Specialized (higher) professional school.

To enrol in universities, it is necessary to have a document of secondary education (12 or 13 years of study), which in France is called "Bachelor" and is obtained after passing the complex of final examinations held simultaneously across the country. Data on these exams (including the results of students) is made publicly available in the press.

Those without a bachelor degree can gain admission to higher institutions by passing examinations for the diploma of access to higher education (DAEU), which is recognized as an equivalent substitute. DAEU only has two versions: A - humanitarian, B - natural and other specialties.

After two-year post-secondary preparation (tutoring) classes, programs and requirements of which are higher than in the first two years of university, applicants on a competitive basis enter higher education institutions, which train civil servants and guarantee graduates a permanent job by providing education of a very high quality. Admission to the classes is also selective and only on the recommendations of schools and lyceums. In case of failure during admission to higher schools, graduates of preparatory classes freely continue their studies in the third year of university (according to specialization). French community considers public high schools with their educational system of preparatory classes the best achievement of national education system. However, the vast majority of students enter open universities. From the region of Paris spread the practice of students entering information about themselves and desired educational institutions in computer bank, which after receiving all the requests and consideration of multiple parameters expresses an opinion about the place of training in high school.

Qualifications*. All types of qualifications are divided into two groups associated with short- and long-term training.*

“Short” programs last mostly two, occasionally three years and end with the award of professional qualifications giving the holder of the diploma the right to work in industry, commerce and the service sector. There are four main types of short programs of study:

- Programs of university institutes of technology *(IUT) in 19 separate profiles (disciplines) with a duration of two years and the* *award of a university diploma in technology* (DUT), which allows getting to the top positions of the lower and middle levels. DUT is quite popular, so the number of candidates is often many times greater than the number of seats, leading to competitive entry;

- Programs of sections of senior technicians (STS), generally lasting two years and offered by part of the post-secondary schools with specialized programs similar to described above programs DUT, but with higher specialization and the awarding of diploma of a senior technician (brevet de technicien superieur). *The narrowness of professional content is becoming a serious disadvantage in the event of a forced change of occupation, so the STS are less popular option than university institutions.* In many countries, STS equivalents do not belong to higher education;

- The third type of short university program - the two-year and highly specialized program, completing in obtaining a diploma of university S & T education (DEUST), which also brings diploma holder to the labour market in the service sector or industry;

- *Long-term (up to four years) training programs for health and other medical personnel of the lower and secondary qualifications in specialized schools run by the Ministry of Health. Admission to these programs is competitive.*

"Long-term" programs offered by universities and other higher educational institutions of high level. Contingent of these programs make up 68% of holders of bachelor degree (of which 10% do so through preparatory classes). This group of institutions can be classified as follows: a) universities; b) institutions of political studies; c) high schools of several types; d) high ordinary schools; e) schools of art and architecture.

Universities teach by three cycles (2 + 2 + 1). The first involves two years of teaching general principles and the basic disciplines of the selected profile and ends with obtaining a diploma of general university education.

The second cycle lasts two or three years and itself is divided in two parts, the first of which provides licens, and second - maitrise. Studies on the second cycle are intensive and specialized. Diplomas have academic and professional components. Such clarity is disturbed by newly introduced professionalized university institutes (IUPs), which recruit students after the first year, rather intensively train them for three years and after each of them consecutively issue to those who successfully studied, diplomas of DEUG, licens, and in the end - maitrise. *From the holders of the latter Commission carefully picks the best for awarding the title of "chief engineer" (or master engineer - Ingeniuer-Maitre).*

The third cycle in the first option for a year of highly specialized training issues a diploma of higher specialized education (DESS), in the second - for 1-2 years of a broader training prepares students for scientific work, provides them with a diploma of in-depth training (DEA) and gives access to doctoral studies and thesis defence.

Multivariance is also inherent in training after the third cycle. After years of postgraduate studies of the usual university type, one can defend a thesis and to become a doctor of science, and then to work more and get a habilitation to direct research (HDR). The purpose of training is increasing the chances of competitive replacement of posts of university professors.

Engineers with good diplomas from 1993 were able to attend programs, similar to the classic post-graduate specialties, because they can get a diploma of technological research after two years of training and research in scientific centres of appropriate profile (DRT).

Medical specialties have a completely original system of diplomas and degrees, the education is also divided into three cycles.

Institutions of political Studies are small in number and designed to prepare generalist administrators to participate in the competitive substitution of positions in public institutions. Admission to these is competitive, basic program lasts three years, one can also study for 1-2 years more at the third cycle and receive a diploma of higher level.

High Schools of scientific and technical profiles belong to several ministries; have three-year programs and award degrees of engineers (Diplome d'Ingenieur). Entry is competitive and only after the previous two-year study in preparatory classes with an intense and in-depth study of mathematics and physics.

Higher schools of commerce and management are private and for admission require the prior two-year training in specialized institutions of higher commercial education (HEC). Higher normal schools (they are four) have a good reputation as the best institutions for training of teachers for colleges and post-secondary educational institutions. Education lasts four years, mostly; Graduates receive a certificate - teaching permit (CAPES), which can be supplemented by additional professional exam (agregation), passing of which contributes to career development.

Organization of education, academic year and examinations.The academic year has two semesters, starting in September and ending in June. Classes are taught in the traditional way, but the emphasis is on independent work. Professional courses end with exams. Grading Scale is quite specific: from 20 (best) to 0 (worst): 16-19 - very good and excellent, 14-15 - good, 12-13 - sufficient, 10-11 - satisfactory (passing grades), below 10 - unsatisfactorily.

Education of foreign students. France for most foreign students has been one of the most attractive countries for short or long-term training and for full education, since almost all of them study in public universities, where their share reaches 8-9%.

Education is presented in the handbooks of international organizations (UN, UNESCO, Council of Europe, European Union), in the database TRACE, ORTELIUS, the Internet and so on. A foreign national must meet three requirements: confirm language skills, have a grant or pay for education, to achieve recognition of his document of education from the institution where he is planning to study.

Recognition of Foreign Qualifications. France has signed practically all international conventions on recognition and has bilateral agreements with many countries. Recognition procedure is determined by the Ministry of Education, which take into account the conventions and agreements and inform about the final decision on the recognition by the University and other high educational institutions, therefore candidates must apply directly to the management of selected institutions. Because of the specificity of the French education system, often they receive partial recognition and should fulfil additional conditions for final admission.

Therefore, it is much easier for foreigners to enter the "non-competitive" and public universities than to compete with the French, who for many years prepare for admission into one or another big school. This is why more than 95% of foreigners are studying in public universities.

Entrance examinations*.* Entry language exam (held in February in the home country of a foreign student) is for those who want to study in nearly 80 universities of France (peripheral institutions are almost no way inferior to 15 Parisian universities on quality and level of education).

US Higher Education

Formation of higher education. The first steps towards the formation of higher education in the United States were made in the early XVII century. When introduced in the College of Liberal Arts, which created such technical English. Over time, almost all states were salt college. However, if Europe's higher professional schools just constantly there, the US is usually included in the University colleges along with free of Arts and Sciences. Along with a Bachelor they began to confer master's degree and doctorate. Thus, the beginning of XX century. Evolution of American high school institutions has led to the creation of large universities were the main centers of basic science in the US.

Modern principles of higher education.Higher education. In the US, there are several thousand variety of universities, which can be classified in many ways. Yes, in the form of funding are divided into two groups: most largest group consists of private institutions (pay students for learning, self-financing institutions, private donations, sponsorship smaller share of the budget) and government (much of the money coming from the federal and local governmental budgets). In general the state still plays a dominant role, financing a significant share of research programs in universities, holding two- and four-year colleges with nearly 80% of the total number of students.

Most American universities have developed research structure at the level of doctoral programs, the rest - multidisciplinary universities with more training programs for bachelor's degree and master's degree.

Thus, the structure, the level and content of training American specialists share their Universities the following groups:

- *After secondary educational institutions* of various type and semi schools with programs lasting from 1 to 3 years and awarded certificates low levels. The short ends with education receiving a certificate of professional skills, longer - awarding associate degrees *(AssociateDegree)* with the right performance level technicians entering the third year of college with a bachelor programs;

- The local *junior colleges and* two-year program, implementation of which opens the door for the third year "undergraduate" colleges and obtaining an associate degree or professional license*(OccupationalLicense);*

- *College of Liberal Arts, which* is an essential feature of the US higher education system, almost exclusively to the teaching of general subjects such history, chemistry, economics, etc. and awarding bachelor's degree with a minimum of dominant academic and professional content. However, there is a noticeable trend to include in the final four years of the program and professional courses that enhances graduates. But for certain professions, such as medicine and law, to obtain professional qualifications student must also pass a program of post-graduate professional training to reach the level of master's university schools;

- *General (comprehensive)* by assigning *college* diploma as Bachelor and Master programs (pre-specialized include developing and deepening the professional part). Most of these institutions preparing teachers, businessmen, professionals whose activities require a master's degree;

- Independent *professional schools* with bachelor (often masters) level diplomas in the fields of technology, art and more. With close to schools the first group of program content, these schools use much qualified staff with a university education;

- *Universities* with the right training doctors and all the cycles that are the most prestigious group of universities. They include college bachelor level schools for study in master's level and above. Often this group is differentiated on narrower, based on the level of research (number and thematic diversity protected every year doctoral dissertations), the volume of research funding, the presence or absence of medical school with research clinic range of faculties, finally, the number of teachers and students and the ratio between them.

The traditional annual university rankings are; draws particular attention to the list of "25 best US universities," which has long been led by private triple (Harvard, Yale and Stanford) and some state (Michigan and several California).

Among the usual features a group of higher education institutions that are widely used sophisticated communication tools and distance learning. Among the first was known company IBM, which used two-way video via satellite to train its staff simultaneously on both sides of the Atlantic. Today, scientists and teleconferencing became commonplace. Training with instant communication teacher and group of students in many parts of the US also increasingly being used.

Overall structure of American universities very diverse, but the main link that also does most of their tasks, the composition is small branch or department head who can be appointed as well as elected. He and his colleagues decide all questions of teaching certain disciplines and scientific work in the direction department. Higher level (divisions, colleges and all educational institution) only approve collective decisions Department.

Access of citizens to education. Higher education belongs to the US public, after creating quite acceptable conditions for entry into universities to those who desire to continue their education after high school, which has 12 classes (versions 6 + 3 + 3 + 4 or 8).

By entering most universities after graduation final level of secondary school *(highschooldiploma),* which dominates general education with minimum specialization. Citizens without such a document can get equivalent (certificate or diploma) with the right of admission to universities after the preparation of a package of special tests of general educational development.

To enroll, in addition to test results, taking into account many other parameters: the results of the interview, recommendation schools and teachers, a candidate in the after-hour activities (sports, humanitarian work, artistic admiration and achievements, etc.), social security and FSUs, family composition etc.

Higher education in the United States paid, tuition is high, so many students combine study with work. The cost of one academic year is not constant and depends on the state level and prestige of the university, his belonging to the state or the private sector. US Education Act (1938) provides financial assistance to poor students; in addition the system support the best students (scholarships, various grants).

Training, academic year and examinations. The flexible degree system of the American high school allows interrupt training at any level, change the profile of training, continue education. In the master's and doctoral selected only bachelors with success not lower than "B" positive response, a written recommendation from one or two teachers. They must successfully pass the examinations held twice a year.

Apprenticeship at master depends on the particular specialty: half of the year in the arts to two or three years in medicine and psychology. At the end of training should write abstract review, to submit a thesis or an exam.

The main criterion for selection of candidates is the ability to doctoral research. Within 2-3 years of doctoral study is to learn a significant amount of theoretical material, getting him to 72 credits of the 20 exams, pass qualifying exams and defend a thesis.

The leading US universities are another form of speed training - postdoctoral, to verify their scientific ideas and experimental confirmation.

Therefore, the academic year (September- end of May) is divided into two semesters with a duration of 14 to 18 weeks each. At the same time students study 4-5 subjects, making the program after exams.

Practiced all occupations; lectures can read for small, medium and large (1,000 students) flows. Once or twice a week in small (15-30 students) groups held workshops on the topics of lectures, which students prepare their own libraries. Partly as a university tutor training option is used when the teacher several times a week with a small group of works of the same students for careful monitoring of their independent work.

Ratings, like England, denoted in capital letters: A - Excellent (4 points), B - good (3) C - mediocre (2), D - Passage (1), E - Poor (0). For example, if the object is estimated at 2, the student receives 4x2 = 8 points. 1 Subject to credit for final evaluation “good” student adds 3 points. For bachelor’s degree in 4 years (8 semesters) to dial 120 points or more (but GPA exceed “2”, and this is possible only in case when the student came across well and exams passed).

Teachers. Levels of hierarchy of teachers in higher education are five professors, associate professors, assistant professors, instructors, lecturers. The first two groups are in constant state, assistant professor for doctoral title shall be adopted at the reception exams (1-3 years), after which they are either transferred to the state, or they are advised to offer its services to other universities. Evaluation of teachers every year. Included are three parameters: scientific production, quality of teaching, the nature and scope of extracurricular activities (peer review, expert services, etc.).

Qualifications. Universities in the US compared many different qualifications, diplomas and certificates awarded upon completion of programs at various levels. Levels higher education - three.

The first is the level of bachelors, which often lasts four years (except medicine, law, and some other specialties). A common division of time into two halves when first taught general subjects, of which less than 50% relates to future specialization, and the second such items already more than half. Diplomas *(Bachelors-Degree)* of this content - mainly academic qualifications and diplomas are Bachelor of Arts or Science. The program on the second level of specialization in a particular area for 1 -2 years ending awarding master's degree *(MasterDegree).* The requirements to obtain quite varied: writing abstracts (Research) exam in a foreign language, the testimony of the ability to use computers and databases, final exam.

The third level is postgraduate training and doctoral thesis, which requires scientific studies over 3-5 years after obtaining a master's degree. The current requirements depend on the realm Studies: scientific work and the protection of written material on her dissertation, general or professional exams and so on. Last consist mainly during the first two year s doctoral studies. Usually after the third level of higher education awarded the title of Doctor of Philosophy (PhD), which is the highest academic rank in the US.

Training of foreign students. Higher education USA belongs to the most accessible to foreigners, although its cost is quite high. Country for many years, holds global leadership as the number of foreign students (not according to their percentage of all students), and the number of countries from which they come. To train sufficient fulfill three prerequisites: to prove proficiency and pass the Test of English as a Foreign Language (TOEFL) with an estimate of more than 500 (in the best universities - more than 550) or another equivalent test; have a certificate of completion of secondary education 12 years that American university wanted to recognize equivalent national diploma for high school; pay for training.

US policies aimed at maximizing the involvement of foreigners in the country's institutions, therefore created a powerful variety of agencies, organizations and agencies for this task. Institutions of higher education based on representation of the US candidate finally decide on permission to begin training. This decision was adopted for 6-12 months before the beginning of the school year.

Higher Education in Japan

Formation of higher education. The first educational institutions to include Japanese scientists VIII. Academy for training senior civil servants was set long ago as in 1633 in Tokyo, and the Decree on the implementation of three-stage education appeared in 1872, however, the transition from elite to mass education took place in Japan after its defeat in World War II, when all the nation's efforts were aimed at building the country. As was based on the American model of education, which the Japanese significantly modified based on their own achievements and traditions. In 60 years the number of students has increased 7 times, reaching 1.5 million, and the amount of doctoral studies -in 215 times. Japanese scientists were trained in university research laboratories most developed countries. Significant role played by the fact that the government has created very favorable conditions for the development of private higher education sector. Extremely rapid economic and technological changes put forward such demands to the education system that the Japanese were forced to constantly modify it by opening all new types of educational institutions and improving programs and teaching methods. It has become customary full secondary education of 12 years for all; growing percentage of young people who enrolled in university-level institutions.

Modern principles of higher education.Educational institutions. 1993 district. In Japan, there were 489 universities (daigaku), more than 520 junior *(tanki - daigaku)* and 65 process *(koto - senmongakko)* colleges, more than two thirds of them are private sector. In coordination and planning of education involved a large number of public organizations: National Association of Universities, the Association of Local Universities, Association of

Private Universities, Japanese University Accreditation Association, the Central Council for Education and the National Council of Universities and Colleges.

In addition to dozens of classic universities in Japan, many other functions: educational, technical, economic, agricultural, Buddhist unusual for us, women, Christian and others. To the university system include schools, colleges and institutions (often with 1-2 departments), which programs prepare high level specialists necessary for the country profiles. Concerning universities in Japan were complex, where are the institutions at all levels of education - from kindergarten to technical colleges, graduates of which have significant advantages for admission to universities. Obtained in junior colleges and technology within 2-3 years of program loans credited in university-level institutions.

Interestingly founded in 1983 in Japan, a powerful “virtual university” with remote applications and distance learning, using all achievements of modern technology and broadcasting information. System after secondary complement its education more than 1,500 specialized (professional) schools to prepare annual programs to work on complex enough Japanese labor market.

Access of citizens to education. Secondary education in Japan lasts 12 years and is divided into three stages of equal duration, of which the latter is quite differentiated and uses a credit system of incorporation executed (certificate requires 85 credits, each of which corresponds to 35 hours of classes).

Admission of students to higher education sufficiently regulated. The accession process is complex and lengthy. First National Center Admission to universities centrally holds the same for all schools test to verify student achievement. Those who overcome this barrier, are able to take the entrance exams and interviews take place in selected university. Do not forbidden to pass a test at the same time in several universities, preferably those who have reached good results after several failed attempts at previous sessions of the entrance. Examinations play a critical role in the education system of Japan, such as common are tutoring services and relevant institutions of different types, so Japanese schoolchild and learn "in two shifts": in the morning at school, in the evening - as tutors.

The school year begins in Japanese Universities in April and ends in March. It consists of three trimesters of summer holidays. The first two years, students usually learn at a general faculty, followed by specialization.

Training, academic year and examinations. The content and the structural construction of higher education in the Japanese borrowed almost US with their four-year cycle of basic education diploma (for medical specialties perform a full program requires 6 years). These years divided into two two-year parts, the first of which - general, the second - specialized. However, Japanese graduate university or technical college continues to study several months at his workplace. And the future self is not terminated for the creation of a national center test provides all the necessary kit employers tests to regular "check" to verify the professional growth of employees.

Applicable 100-point rating system of evaluation: 100-80 points – excellent (estimated by the letter A) 79-70 – well (estimated by the letter B) 69-60 – satisfactory (estimated by the letter C) 59-0 – unsatisfactory (estimated by the letter D).

The academic year is 35 weeks (credits) or 210 school days. Language of instruction – Japanese. After completing the four-year program offers several final exams, which is most successfully.

To obtain a bachelor's degree, a student must score over the 4 years training a certain number of credits (Tan, like the US credits) of defined groups of subjects. Of the total 36 124 Tan accounts for general subjects, 8 - in a foreign language, 4 - Physical education and 76 – for professional discipline. For one Tanju, to listen for 15 weeks for one hour lectures (one-it requires self-training), participate in weekly 2-hour seminar (one-self requires training), participate in weekly 2-hour laboratory work (requiring 3- hour self-training).

The second cycle education is a two-year master's program, which is overcome only one or two bachelors of 20-30, with further good chances (over 20%) to continue its growth in doctoral studies and doctoral title. To obtain the title of "master" student must gain two years 30 Tai, write a research paper and defend it, to pass the exam in a master's degree.

For obtaining a doctorate to finish 5-6-year doctoral receive 30 Tai, write a dissertation and pass the exams.

The basic structural unit of the university – faculty, which is divided into several departments. The main categories *are teachers,* professors, associate professors, assistant professors and researchers.

However, due to the high diversity of educational institutions is another assistant, lecturer or instructor.

Qualifications. A set of educational qualifications in Japan not too wide, given the large variety of universities, as Japan has long been debate about the desirability of more qualifications, are experimenting with short-term training programs engineers, but this did not significantly affect the higher education system as a whole.

Training of foreign students. To enter they must comply with the same conditions as the Japanese applicants, but it must first issue the visa. The main difficulty in teaching foreigners – a large expenditure of time for the necessary mastery of spoken not only Japanese, but also very fast reading texts transmitted characters. Standard length of language courses for foreign candidates - 3,5 years.

Admission to private institutions not substantially regulated, public sector institutions to appeal goes through the Ministry of Education. Foreigners with Japanese citizens have enough to successfully compose and perform all examinations written and oral tests.

Students Japan hardly get scholarships because under these conditions a foreigner is difficult to rely on grants or financial support from the Japanese government, promising to find some other funding.

The best chances of getting government aid are candidates for a master's program, but the entry must study in their home country at least 16 years at all levels of education.

Tuition is high enough, even more expensive - just stay. Obviously, all these difficulties lead to the fact that all over Europe studying in Japan just a few hundred students, but the bulk of the foreign students are representatives of neighboring countries with hieroglyphic writing - Taiwan, South Korea and China.

3.2.3. Comparative analysis of higher education systems in certain European countries

From the above characteristics clearly reveal national peculiarities stepwise, qualification, specialized, and hence organizational training, that causes considerable difficulties at the transition of citizens from country to country for receiving or continuation of education as well as in recognition of qualifications for jobs. So recently due to globalization and European integration processes there is an urgent need for unification of degrees and qualifications through theconvergence of structure, organization and content of education in various European countries.

For a better perception of these differences and understanding of the required changes and unification we present comparative tables of structure and organization of higher education in some European countries.

Table 3.1

The structure of education and degrees in some European states *

State	System of higher education		The structure of university degrees		Doctor degree structure	
	Unitary	Binary	Single level	Doubled	Single level	Doubled
Austria		x	x		x(c)	
Belgium (Fr)		x	x(d)		x	
Belgium (N1)		x	x(d)		x	
Greece		x	x		x(b)	

State	System of higher education		The structure of university degrees		Doctor degree structure	
	Uni-tary	Binary	Single level	Doubled	Single level	Dou-bled
Denmark		x		x		x
Ireland		x		x	x	
Spain	x		x		x	
Ireland		x		X		x
Italy		x(a)	X		x	
Liechtenstein		x		x	x	
Luxembourg		x	-	-		
Netherlands		x(f)	X		x	
Germany		x	x(e)		x(c)	
Norway		x		x	x	
Portugal		x		x	x	
United King-dom of Great Britain and Northern Ire-land	x			x	x	
Ukraine		x		x		x
Finland		x		x	x(b)	
France		x		x	x(b)(c)	
Sweden	x			x	x(b)	

* According to the source [13]

Nota-bene: *a - preferably binary system of higher education with a relatively small non-university sector; b - proposed "intermediate" degree-oriented study. In Finland and Sweden for a degree of discretion; after someone received it doctorate lower and it is not a prerequisite for further studies for a doctorate degree. In France and Greece, "intermediate" level - a prerequisite for doctoral study program; with apart doctorate, there is also a Habilitation (Habilitation); d - degree structure in (Fr) and B (N1) may be considered both one- and two-tier. Degree Kandidaats (first degree with 3 years of study).*

Table 3.2

Characteristic of the mechanism to obtain higher education in some European states [13]

Country	The enrollment for higher education	Norma and restrictions for admission to universities
1	2	3
Austria	General requirements for access to higher education: a valid certificate of graduation from high school or equivalent. There are specific requirements for admission to study the chosen program. Allowance is also something which country issued certificate high school graduation.	No restrictions on admission to universities. Admission to Fachhochschulen limited entrants take entrance exams.
Belgium(fr}	By universities can be credited to all applicants who have valid certification on graduation from high school. Exception - several areas with special requirements (eg., Engineer); for education in the following specialties must pass an entrance exam.	Restrictions in.
Belgium(nl)	Except for a few areas with special requirements, a university can be admitted all students who have a valid certificate of graduation from high school. Entrance examinations are students (Flemish or others) who have chosen areas of study engineer, architect, dentist, medical science (university degree), marine science and art (degree Hogescholen)	

Continued Table 3.2

1	2	3
UK	General requirements for access to higher education, exams increased levels of two or more subjects or equivalent qualifications, which includes the following professional qualifications: National Diplomas GNVQs, NUQs at BTEC. To enroll as necessary to perform basic and special course requirements.	Restrictions for admission are in some areas under-preparation. Institutions have the right to set their own limits.
Greece	General requirements for access to higher education: a valid certificate of graduation from high school and exams Panhellenic.	Admission to universities conducted with careful selection, limitations to recording exists in all areas of training. Under the new reform “Education 2000”,Panhellenicexaminations canceledand introduced more flexible system of admission to universities.
Denmark	General requirements for access to higher education: a valid certificate of graduation from high school or equivalent. There are specific requirements for admission to study the chosen program.	Except for a few areas of training (medicine, some paramedics specialty and so on. al.), restrictions on admission there. The institutions have the right to establish restrictions in its sole discretion, eg., for lack of seats.

Continued Table 3.2

1	2	3
Ireland	General requirements for access to higher education: a valid certificate of graduation from high school. In part, there are specific entry requirements.	Complete restriction for admission there, but universities have the right to select students in accordance with their own standards.
Iceland	Despite the general requirements for access to higher education (effective certificate of graduation from high school or its equivalent), there are specific requirements for admission to study the chosen program	Limitations exist when enrolling in some training areas.
Spain	General requirements for access to higher education: a valid certificate of graduation from high school or equivalent qualification and one year training courses COU or Bachillerato LOGSE. In addition, the entrance examination for admission is made in most areas of study.	Limitations exist when enrolling in some training areas.
Italy	General requirements for access to higher education: a valid certificate of graduation from high school or equivalent qualifications.	Limitations exist when enrolling for courses DU, as for those limited number -university courses.
Liechtenstein	General requirements for access to higher education: a valid certificate of graduation from high school or equivalent qualifications.	No information.

Continued Table 3.2

1	2	3
Luxembourg	General requirements for access to higher education: a valid certificate of graduation from high school or equivalent qualifications.	Restrictions for admission there.
Netherlands	General requirements for access to universities: current certificate of graduation from high school (VWO-13-yearsecondary education).General requirements for access to Hogeschoolen(universities of professional education) - a valid certificate of graduation from high school(HAVO -12-year secondary education).Admission depends on the specific requirements for admission to study the chosen program.	Limitations exist when enrolling in some training areas.
Germany	Access to admission to universities require 12-13 years of secondary education (Abitur) or equivalent qualification. Access to Fachhochschulen requires 12-year secondary education. (Fachhochschulreife)or an equivalent qualification. There are specific entry requirements for admission to training for some programs, especially music academies and academies of Fine Arts.	Except for some areas of general restrictions on admission to the universities there. Admission to Fachhochschulen limited in some areas.
Norway	Despite the general requirements for access to higher education (effective certificate of graduation from high school or its equivalent), there are specific requirements for admission to study the chosen program.	Restrictions for admission are the majority-line training Kyiv

Continued Table 3.2

1	2	3
Portugal	General requirements for access to higher education: a valid certificate of graduation from high school or equivalent qualifications.	Limitations exist when enrolling for most seminars training. Students have the right to have them offered a place of study ,but it may not always co-fall from the student's choice.
Ukraine	There is the presence of the certificate of graduation from high school or special vocational institution certificate external testing.	Total number of students enrolled to universities, determined the licensed volume covered by the state licensing agency. Number of prospective students who come to study state-determined public order, forming the Ministry of Education and Science of Ukraine.
Finland	General requirements for access to higher education: a valid certificate of graduation from high school or equivalent qualification and examination for admission to the university. Enrollment is usually run Based on estimates exam admission to universities / certificate of high school graduation and entrance tests.	Limitations exist when enrolling for most areas of learning.

Continued Table 3.2

1	2	3
France	General requirements to access universities: valid certificate of graduation from high school. Other admission requirements there. The rest of the educational institutions have different entry requirements.	The system is limited adoption for admission to university is not applicable. Other types of institutions (IUT and Grandes Ecoles) or title conduct a thorough, careful selection of tea for admission.
Sweden	Despite the general requirements for access to higher education (effective certificate of graduation from high school or its equivalent), there are specific requirements for admission to study the chosen program.	Restrictions for admission exist in all areas of training. The school has the right to set limits on the number of students.

Note: According to the Lisbon Treaty (Lisbon Convention),the terms “access» (access) and “enrollment» (admission)connected to each other, but have different meanings. They represent different stages of the same process that leads to participation in higher education. Compliance access(access) is necessary but not always sufficient in order to be admitted to study in higher education (to get a place of education).

Table 3.3

The organization of the academic year at universities of some European countries[13]

Country	Beginning school year	Organization of the school year
1	**2**	**3**
Austria	September - October	The school year consists of two semesters; training in the first term -with 1 October to end of January, in II –from March 1to the end of June.
Belgium (fr)	September - October	The academic year at universities can be an organization: a) training and exams for a year at the end of June; b) the division of the year into semesters, exams at the end of each semester.
Belgium (nl)	October	The academic year at universities can be an organization: a) training and exams for a year at the end of June; b) the division of the year into semesters, exams at the end of each semester; c) division, at the trimester exams at the end of each trimester.
UK	End of September - beginning of October	Educational Institutions differently organized academic year. The basic model of the school year based on a system of trimesters and semesters. Some schools organize work for the semester of semester structure. Periods of exams set their own educational institutions. Expected to increase the number of educational institutions that organize academic year for the semester.

Continued Table 3.3

1	2	3
Greece	Education begins in mid-September	Training calendar is divided into semesters. The first semester starts in mid-September and ends with examinations in January / February. The second semester starts in late February and ends in mid-June exams.
Denmark	The middle of August - first week of September	Typically, the academic year is divided into three semesters: September - end of January, February - end of June. Most exams consist in January and June. The academic year in some training programs in the non-university sector is not divided into semesters, examinations are at the end of the school year.
Ireland	Of course, in October, at times - in September	. Typically, the academic year is divided into three trimesters. Recently, however, many universities have moved to a system of two semesters, so the problem of the division of the academic year into semesters and trimesters is being actively discussed.
Iceland	Beginning in September	The academic year is divided into two semesters. First semester: September - December, the second January-May. Exams take place in January-May.
Spain	First / second week of October	Training organized by the annual system. Some universities use the semester.

Continued Table 3.3

1	2	3
Italy	Until recently academic year starts on 1 November. Recently, some universities have introduced semester system because training starts earlier.	The academic year at universities may have the organization: -rich-in basis - the basis of compact semester - a familiar semester basis. The most commonly used base compact semester.
Liechtenstein	Late October	The academic year is divided into semesters. The first semester begins no later than the end of October and the second -in April.
Luxembourg	Beginning in October	The academic year at the University of Luxembourg center (Centre Universitaire de Luxembourg) consists of two semesters.
Netherlands	Late August - early September	The academic year is organized by one of the following models: a) division of the year into two semesters. First semester: September - the end of December; second semester: January / February -July) modular system. Usually consists of five modules / blocks, each of which lasts about eight weeks (two before Christmas, three after Christmas).Exams consist of the end of each semester or block.
Germany	September October	The basis of the academic calendar is two semesters system. There are some differences in academic calendars between university and non-university sector. The first semester usually starts in early or mid-October and ends in mid-February, the beginning of the second semester in the middle.

Continued Table 3.3

1	2	3
		April, ending -in July. Exams consist of the end of each semester.
Norway	Mid-August	Typically, the academic year is divided into two semesters. The first semester lasts from mid-August to December, the second from mid-January to mid-June, including the examination period. Some schools use the system trimesters
Portugal	Beginning in October	The most commonly used semester system. Exams typically consist in January-February and June-July.
Ukraine	1st of September	The academic year usually consists of two semesters (September 1 - the beginning of January, 1 February - end of June). In some universities the academic year is divided into three trimesters.
Finland	The middle of August or middle of September	The academic year is divided into two semesters. Exams consist at the end of each
France	the 1st of October. Training starts at times can vary	Organization of the school year may be based on: a) an annual basis with exams at the end of the school year (in June);b) semester basis with exams after each semester (usually in January and June).
Sweden	End of August	Organization of the school year is not regulated by the state. Most schools use the system) ‘division into two semesters. Training courses and the program can begin in January.

Table 3.4

Tuition fee and financial support for students study abroad in some European countries [13]

Country	The tuition fee	System support students to study abroad
1	**2**	**3**
Austria	Free training for students who are citizens of the country, the EU and some other categories. Pay teaching students who are nationals of countries not mentioned above.	Financial assistance may be available for the entire period of study. Students who receive a national grant, are eligible for financial aid to study abroad for a period not exceeding 20 months.
Belgium(fr)	After checking the solvency set fee for registration and fees. The amount depends on the level of study. Low salaries have also been established for participating in the examinations. Tuition fees - about 650 euro per year.	Financial assistance for study abroad is not available.
Belgium(nl);	After checking the solvency is charged for tuition. It depends on the level of study. Tuition fees - about 460 euro per year.	Financial assistance for study abroad is not available.

Continued Table 3.4

1	2	3
UK	Students who are nationals of countries or the EU, and the students are making different the rest of the tuition fees. Students OK-citizens or EU competition bachelor education in hospital costs 1,025 pounds. Tuition fees set after checking the solvency and can partially or completely dependent on profits. Educational institutions independently set the amount paid for tuition for part-time students, students who obtain post-bachelor degree students and citizens of countries that are not EU members.	Financial assistance may be granted for study abroad at current rates (both part of the course, and for the full course leading to a degree).
Greece	Free training for students who are citizens of the country and the EU. Students study in other countries pay.	General government financial support for study abroad No
Denmark	Free training for students who are citizens of the country and for foreign students.	Financial assistance may be provided for training at current rates (both part of the course, and for the full course leading to a degree) lasting four years. The maximum term of six years in the Nordic countries.

Continued Table 3.4

1	2	3
Ireland	1996 abolished the system of payment for training for the first level. All next level education paid.	Financial support may be granted for the full cycle.
Iceland	Free training for students who are nationals of the country and the EU for foreign students.	General government financial support for study abroad there.
Spain	After checking the solvency set tuition fees of the students who are nationals of countries, EU and foreign students.	General government financial support for study abroad there.
Italy	After checking the solvency set tuition fees of the students who are nationals of countries, EU and foreign students. The amount depends on the level of study.	General government financial support for study abroad there.
Luxembourg	Study is uncompensated.	General government financial support for study abroad there.
Netherlands	After checking the solvency of the students who are citizens of EU countries and will be charged tuition fees of about 1,200 euro. For foreign university students determine the amount of premium own.	Financial assistance may be granted for studies abroad in existing programs (both part of the course, and for the full course leading to a degree).

Continued Table 3.4

1	2	3
Germany	Free training for students who are nationals of the country and for foreign students.	Financial assistance may be granted for study abroad for a period of 1 to 1,5r.
Norway	Free training for students who are nationals of the country and the EU for foreign students.	Financial assistance may be granted for study abroad at current rates (both part of the course, so for the full course leading to a degree).
Portugal	Tuition fees charged to students who are nationals of countries, EU and foreign students. For programs for the degree of Bachelor amount is 294 euro	Students studying abroad for a short period of time, not suspended the payment of their grant.
Ukraine	For students who study on public order, education free. In addition, the successful training paid a monthly stipend by the state. Admission to the study carried out at the expense of the state to order the state (target direction) or tender conditions. Citizens have the right to study at their own expense and costs employers, sponsors and others. For foreign citizens study paid, except as provided by international agreements	Financial aid for training, generally not covered, except as provided by international agreements. Possible tuition loans from government institutions.

Continued Table 3.4

1	2	3
Finland	Free training for students who are citizens of countries with the EU and for foreign students.	Financial assistance may be granted for study abroad at current rates (both part of the course, and for the full course leading to a degree).
France	After checking the solvency is charged for the registration of students who are nationals of countries, EU and foreign students. The amount ranges from 100 to 230 euro.	Financial assistance for study abroad may be granted for a period not exceeding one year.
Sweden	Free training for students who are nationals of the country and the EU for foreign students.	Financial assistance may be granted for studies abroad and at current rates (both part of the course, and for the full course leading to a degree).

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Part 4

INNOVATIVE ACTIVITY IN HIGHER EDUCATION INSTITUTIONS OF UKRAINE

4.1.General characteristics of legislation in the sphere of innovative activity

In the list of the most innovative countries in the world, which was published in early 2013 by Bloomberg, Ukraine entered to the top 50 countries and took 42 place. Thus, agency Bloomberg examined indicators of more than 200 countries and sovereign regions to identify their innovative factor. The final list was reduced to 96, of which 50 selected.

The legislation of Ukraine in the field of innovative activity based on the Constitution of Ukraine [3] and consists of the laws of Ukraine “On investment activity” [9], “On scientific and technical activity”, “On scientific and technical expertise”, “On innovative activity” [10] and other laws regulating social relations in this sphere.

Legal prerequisites for state innovation policy laid down in the Constitution of Ukraine, in which Article 54 guarantees its citizen’s freedom of scientific, technical and other creative activities, protection of intellectual property rights, copyrights. Article 116 obliges the Cabinet of Ministers of Ukraine to ensure the implementation of economic policy in education, science and culture. Under paragraph 4 of the same article the Cabinet develops and implements national programs of economic, scientific-technical and cultural development of Ukraine.

Legislative support of scientific, technical and innovative activities in Ukraine launched by the Law of Ukraine "On the basis of the state policy in the sphere of science and scientific and technical activity"[12] which creates conditions for scientific and technical activities, ensuring the needs of society and the state in technological development. This law eventually changed, and in 1998 was adopted a new law "On scientific and technical activity" [11].

Basic Law of Ukraine On scientific and technical activity from December 1, 1998 determines the main directions of the state policy in this area and the legal framework of the authorities. Its provisions have developed in the Law of Ukraine On innovative activity from 4 July 2002, which was made the transition from an emphasis on science and technology to the innovative methodology of project management processes. The law was defined institutional mechanisms and means of financial support for the implementation of innovative projects. In particular for innovative enterprises the Law established: exemptions from income tax; exemptions from paying land tax; exemptions from value added tax; customs privileges; depreciation benefits. The overall objective to stimulate the realization of investment and innovative projects is to reduce the tax liability of the taxpayer by reducing both its direct and indirect use of the mechanism that provides for tax deferral or installment payment, which is a hidden form of credit [14].

Current today the Law of Ukraine "On scientific and technical activity" largely obsolete so the provisions of a new draft law significantly updated and improved to meet the requirements of today, when Ukraine on the path of European integration, and when signed an agreement on associate participation of our country in scientific and innovative EU program "Horizon 2020".

The draft law provides a definition of separate notions and and sets out a number of basic terms in the new actualized edition. The provisions of this document are most focused on the creation of new approaches to the management and funding of science, ensure the efficiency and transparency in the implementation of research and development and for their funding, and to enhance the efficiency of interaction between members of the scientific community, governmental agencies and the real economy in the formation and implementation of state policy in the field of scientific and technical activities.

Great attention in the Draft Law is paid to the National Council of Ukraine on the development of science and technology. Creating such a council as a permanent advisory body under the Cabinet of Ministers of Ukraine will provide effective interaction of representatives of the scientific community, governmental agencies and the real economy.

In addition, the Draft Law provides establishment of the National Research Fund of Ukraine, whose main function will be grant support:

- implementation of scientific research and development;
- development material and technical base of research and development on high level;
- organization of conferences, symposia and other communicational scientific events;
- training of researchers, including abroad;
- popularization of science.

At the same time fund will be able to provide individual, collective and institutional grants.

Great importance in this document is given to strengthening social status of scientist, improving conditions of work and pension provision, as well as the promotion and encouragement of young scientists.

In particular, the bill contains provisions that are introduced:

- flexible regime of working time in a scientific institution;
- elimination of financial discrimination against sectoral science by shifting the burden of financing payments to research pension on the state budget;
- the possibility of obtaining housing by scientists at the expense of target budget or other sources of funding and its construction by gaining preferential long-term loans;
- creation of public youth scholarships, awards and grants.

At the same time by the Draft Law is settled issue concerning the possibility of researchers to improve their qualification and undergo traineeship both in Ukraine and abroad without loss of employment and academic experience.

The Draft Law also focuses on issues of research infrastructure, including normalization in creation of such element for the infrastructure of scientific and technological activities as Center for collective use of scientific equipment. In addition, this document created a legal basis for the introduction of new organizational form of research infrastructure – State key laboratory.

Such norms are the effective mechanisms of state focused influence on solving the most pressing problems of scientific development, support the most promising areas of scientific research and to ensure maximum effectiveness using the most modern scientific equipment and concentration of the best scientific representatives to address key challenges facing the state.

The Draft Law contains norms that are designed to stimulate the activity of scientific institutions. Its provisions for research institutions introduced the possibility:

- be the founder of other legal entities engaged in research and scientific and technical activities;
- be the founder of the joint stock companies and limited liability companies;
- establish scientific and technical complexes.

In addition, the provisions of the Draft Law provides exemption from paying to the general fund of the State Budget of Ukraine a part of income (profit) from its financial and economic activities of government business enterprises and state-owned enterprises that relate to academic institutions, scientific-technical complexes based on state property.

Separately, document regulates the state certification of scientific institutions on the basis of adopted by the Committee of the European Research Area scientometric indicators and establishes that the level of core funding for these institutions will depend on the results of this certification.

The document contains a separate article regulating grant funding of scientific and technical activities from the state budget, which will be provided free of charge and irrevocably exclusively on a competitive basis without applying procurement procedures.

Great attention in the Draft Law is given to democratization of internal control procedures at the National Academy of Sciences of Ukraine and in the national sectoral academies of science.

Separately a norm is fixed concerning the status of the National Academies as key spending units and kept current law provisions concerning the right of academic self-government and independent solution by national academies of all matters relating to the implementation of this right. At the same time introduced norms that stimulate integration of academic and university research.

The law establishes the main objectives of international scientific and technical cooperation, including the integration of Ukraine to the European Research Area and the form of such cooperation, including – participation in relevant EU Framework Programmes for Science and Innovation.

The Program of Economic Reforms for 2010-2014 "Prosperous Society, Competitive Economy, Effective State"objective of the reform in the innovative sphere defined activation of innovative processes, full utilization of the potential of science in the technological modernization of the economy. For the achievement of indicators defined in the Programme of economic reform is necessary, first of all, to improve the legal framework of innovative regulation.

For the purpose of concentrating financial resources on breakthrough directions of innovative development the Law of Ukraine "On priority directions of innovative activity in Ukraine"-defined strategic priority directions of innovative activity. To implement the strategic priorities the Government of Ukraine approved the medium-term priorities of innovative activity on national and sectoral levels for 2012-2016. They are determined based on the results forecast-analytical (forsyth) research with regard to world technological trends. SASII of Ukraine (The State Agency of Ukraine on e-governance) tasked to ensure the monitoring of the priorities implementation.

Cooperation in the sphere of science and technology

1) The work on renewing the Agreement between Ukraine and the EU on Scientific and Technological Cooperation (carried out arrangements for internal approval of the draft Agreement) and ensuring Ukraine's participation in the EU research and innovative program «Horizon 2020». Ukraine's participation in the EU «Horizon 2020» (indicative amount of program funding – 80 billion. Euros) will promote the creation of necessary conditions for the implementation of research activities in different sectors (energy, transport, health, environment, food safety, space, etc.), including by providing access to research infrastructure, the development of innovations in the industrial sector and new technologies. Ukraine's participation involves the payment of annual financial contributions (except in 2015) totaling about 35 mln. euros. Agreed text of the relevant Agreement.

2) 4-5 December 2014 held an international scientific-practical conference «Integration of the National Technology Transfer Network (NTTN) to the European network». During the conference was signed a Memorandum on cooperation in integrating NTTN to the Enterprise Europe Network (EEN) and the Agreement on cooperation in science and technology between 24 NTTN coordinator and Foundation of Central European Academy Studies and Certification (CEASC), Poland [1].

March 3, 2015 by the exchange of diplomatic notes was restored the Agreement between Ukraine and the European Community on scientific and technological cooperation. Reference. Scientific and technical cooperation between Ukraine and the EU performed on the basis of the Agreement between Ukraine and the European Community on Scientific and Technological Cooperation of 4 July 2002. This Agreement requires constant updates on the following five-year periods. Under the Agreement established the Joint Committee Ukraine-EU on cooperation in science and technology. During the implementation of the Seventh Framework Programme for Research and Innovation EU, Ukraine has gained a leading position among the Eastern Partnership countries and entered the top ten most active partner countries, second only to the United States, Canada and the BRICS countries. Academic institutions and higher educational institutions of Ukraine participated in 126 projects of the Seventh Framework Programme of the EC funding volume of around 26.5 million EUR [16].

March 20, 2015 signed an Agreement between Ukraine and the European Union on the participation of Ukraine in the European Union Framework Programme for Research and Innovation «Horizon 2020». Reference. The agreement signed by the Minister of Education S. Kvit and EU Commissioner for Research, Science and Innovation Carlos Moedas. According to achieved agreements Ukraine received an unprecedented high of 95 percent discount on the financial contribution that as a result was 35 579 782.09 EUR for the following 2015-2020 despite the fact that its payment will start from 2016 (Ukraine payment of the first installment for 2015, which is 5,002 872.87 euros carried forward for the next period by the distribution of this amount on the following years).

The priorities of the program «Horizon 2020» – promoting fundamental scientific research, improving the competitiveness of production, nanotechnology, new materials, biotechnology and space industry, as well as search for answers to the most pressing social challenges in health, ecology and demography. The program brings together all existing EU funding programs for research and innovation, including the «Framework Program for Research», «Framework Program forCompetitiveness and Innovation» and the activities of the European Institute of Innovation and Technology. Total funding to support research and innovation within the program provided in the amount of about 80 billion euro. Ukraine entered the 11 of leading research countries in the world, identified by key strategic partners in the EU program «Horizon 2020», also our state is recognized as the only strategic partner of the EU in Eastern Europe.

4.2. Scientific, scientific-technical and innovative activity in higher education institutions of Ukraine

4.2.1. Research universities as centers of innovative development of higher education

Research University – national institution of higher education, which has significant scientific achievements, conducts research and innovative activities, provides integration of education and science with production, participates in implementation of international projects and programs.Providing higher educational institutions of Ukraine status of research university realized by the Cabinet of Ministers of Ukraine on the submission of the Ministry of Education and Science of Ukraine.Status of researchuniversity is provided in order to increase the role of the university as a center of education and science, training of highly qualified scientific and educational staff, implementation in practice of scientific advances, technical and technological developments, realization, along with other higher education institutions and research institutions of joint programs in the priority areas of fundamental and applied scientific research to solve important socio-economic tasks in various industries of economy.

The activities of research universities is regulated by the "Regulations on the Research University", approved by the Resolution of theCabinet of Ministers of Ukraine of 17.02.10№ 163.

The status of research universities in Ukraine have:

- National University "Lviv Polytechnic" of 8 July 2009;
- Taras Shevchenko National University of Kyiv of 29 July 2009;
- Yaroslav Mudryi National Law Academy of Ukraineof 29 July 2009;
- Ivan Franko National University of Lviv of 29 July 2009;
- National University "Ostroh Academy"of 29 July 2009;
- National University of "Kyiv-Mohyla Academy"of 29 July 2009;

- National Mining University of Ukraine of 23 September 2009;
- National Technical University of Ukraine “Kyiv Polytechnic Institute” of 3 February 2010;
- National University of Life and Environmental Sciences of Ukraineof 3 February 2010;
- National Technical University “Kharkiv Polytechnic Institute” (NTU “KhPI”)of 3 February 2010;
- V.N. Karazin Kharkiv National Universityof 3 February 2010;
- Vadym Hetman Kyiv National Economic Universityof 3 February 2010;
- National Aviation University of 3 February 2010;
- Volodymyr Dahl East Ukrainian National Universityof 24 March 2010.

The “triple helix” model of innovative development, based on the following key provisions:

1. Due to the progress of society from an industrial to a a society of knowledge in the interaction between the government (central and local government) and economic entities and higher educational institutions consistently increases the role of universities as the subject of creating of new knowledge.

2. The process of strengthening the role of research innovative university is accompanied by intensification of cooperation between them, on the one hand, and government and business on the other; innovative activities is increasingly become the result of this close cooperation, and not the result of the initiative (specific order) by government agencies or industry.

3. In addition to their traditional functions, each of the three main subjects of innovative activity increasingly can partially take over other functions to ensure optimal results. Thus innovative modern university is not only a source of knowledge and personnel, it takes more and more involved in the direct creation of innovative companies and, therefore, in the commercialization of research activities and received education.

Among the defining characteristics of the "triple helix" model functioning in innovative research of universities, should be identified the following:

–mastering by students (especially masters) of basic competencies of innovative activities through their inclusion in the appropriate practice;

– university turns into complete productive communication center of the state, business and society concerning technology, general economic, social forecasting, exchange of advanced knowledge;

– replacement of traditional linear scheme "fundamental research – applied development – implementing" by more flexible organizational mechanisms, based on an ongoing close cooperation with the real economy sector in the search orders for applied development, as well as in creation of innovative enterprises, engaged in the implementation of the results;

– enhancing of international cooperation both in scientific research and in innovative activity associated with the effects of of globalization processes in the field of science and economics.

Thus, innovative activities in modern higher educational institutions is not only a way to attract additional extra-budgetary funding. In modern socio-economic realities it is one of the most important separate tasks of modern higher education, a necessary component of quality educational process.

At the same time the system of higher education in Ukraine and other former Soviet countries as a whole, still has no scientific capacity which is equivalent with the potential of academic institutions. Effectively contribute in solving the above problem capable of innovative educational and research centers that can attract to his work as specialists of relevant research institutions and leading scientists, working in universities, postgraduates and students.

Expansion of educational and scientific and economic autonomy of higher educational institutions will lead to the creation and strengthening of the leading universities in the open environment of the new economy, which provides constant mobility of people with the possibilities changing their functions, competences and qualifications.The basic unit of this open innovative space is a hybrid structure that brings together university departments, research institutes and division of economic activity.In such circumstances, it becomes possible to realize another important potential benefits of leading universities in the creation of innovative environment, which is available at leading universities developed infrastructure facilities, which reduces the need, for example, in new buildings for industrial parks and more.

One of the evidence of development prospects of innovative universities in Ukraine is the rapid development of export sphere of informative technologies, the volume of which, international experts estimated over 1 billion dollars a year, which is twice and more ahead of similar indicators neighboring to our EU member states – Romania, Poland and Hungary.

Just as there are different institutional set up of "triple helix" branch of knowledge, more variety may be specific forms of organization of innovative centers.Nevertheless, they provide the only common element: the creation of conditions for a permanent organization of new businesses that are aimed at the implementation of innovative ideas, scientific results and developments, created in modern universities. Thus universities increasingly have to acquire not only research, but also entrepreneurial features.

In this connection it is necessary to emphasize that innovative structures may have dissimilar organizational forms, depending on the specific conditions of different countries and regions of the same country (technology transfer centers, business incubators, technology parks, etc.).At the same time all these organizational forms are derivatives of the general purpose and direction of innovative university, which became the initiator of the implementation of its scientific results in the economy and, in partnership with the state and business, stimulate the creation of new firms for its employees and graduates in case of absence companies, that are ready to implement innovative developments.Thus, modern innovative or entrepreneurial university – this is not primarily an economic or management educational institution that graduate certified entrepreneurs or managers, and especially higher educational institutions of natural science and engineering and technological profile, lecturers, students and postgraduate students, of which are able to realize their innovative developments, implement in the economy the results of their research and development through the creation of new businesses.

Foreign and national experience shows that the problem solution of the development of modern competitive economy and knowledge society requires optimal use of the latest models of innovative processes, which are the important part of innovative research universities.These higher education institutions, working in close partnership with state and local authorities and economic entities, increasingly turned into centers of innovative development, achieving significant acceleration of the implementation of the results of research and development in the economy demand of technology, products and services.Considering the development of innovative economy, and given the socio-economic conditions and the specifics of educational and scientific system of modern Ukraine, **the development of innovative research universities requires the following tasks:**

- establishment of modern educational and research centers that will attract to its work as lecturers, students and postgraduate students of universities and experts of relevant scientific research institutions of achieving and maximizing the use of their work available for research and training infrastructure;
- increasing dialogue between higher educational institutions, research institutions, representatives of businesses and government bodies on specific issues of improving the efficiency of innovative activity;
- expanding the autonomy of universities and scientific institutions in the implementation of training process and research, as well and in economic activity;
- create conditions for rapid commercialization of the most promising research and development results, including by simplifying the mechanisms of interaction be-

tween new and existing innovative enterprises with the authorities;

- broad use of practical innovative activity of students (especially masters) and postgraduate students with a corresponding adjustment of relevant training programs and plans;
- implementation in higher educational institutions curricula of individual courses and their parts, aimed at mastering the principles and practical methods of modern entrepreneurship and innovative activity, exploring examples of economic and effective implementation of research results;
- initiatives encouragement of students, postgraduates, university lecturers, aimed at commercialization of research and development;
- activation of inter-university (including international) cooperation in the fields of innovative activity, find and implement economically productive ideas and research directions;
- measures, aimed at increasing the degree of recognition of the importance of innovative entrepreneurship in society [2].

The discussion around innovative development of the national economy is carried out in Ukraine for over ten years. Thus, the main social institutions of the innovative process in Ukraine were research institutes, high-tech business and public administration bodies.Universities were not seen in it as serious participants and partners. Rector of the National Technical University of Ukraine “Kyiv Polytechnic Institute” academician Mykhailo Zhurovskiy believes that such an approach was formed during the Soviet times and by inertia transferred to the present. It was believed that for classical education the close cooperation with high-tech production is unnatural, and not every student who obtains basic education will require entrepreneurial skills and competence.At the time, the manufacturing sector, academic science and higher education linked in one innovative complex of centralized planning and management bodies. Today such centralized management of the state is absent. In a market economy the state can offer only the rules of innovative development, political and resource stimulation of important projects and programs. All other interactions between the participants of the innovative process should be carried out independently based on their mutual interests.

According to the cited author, the main constraints in Ukraine for accelerated innovative development are:

- Ukraine'srefusalfromthepolicy ofpriorityscientificand-technologicaldevelopment, withtheexceptionofthemain-productiveforcesofscience, advancededucationandinnovations. Instead, Ukraine is oriented to external borrowing, which, unfortunately, are not used for investment in new technologies and means of production;
- actual problem of Ukraine – an imbalance of the structure and scope of state order for training of specialiststo the needs of the labor market and promising directions of development of the country;
- lack of mechanisms to promote and encourage innovative activity. On the contrary, the commercialization of inventions in Ukraine exerted resistance through not oriented on innovative development tax system, controversial legislation, raids, etc.

An interesting opinion about the existing problems in higher education and scientific researches expressed in the publication of the weekly "Dzerkalo Tyzhnya", whose author believes that the current financing system in Ukraine – completely ineffective. Every year billions of hryvnia throws away not on the development of modern science, but on the social protection of scientists, turning them into a privileged caste after reaching the retirement age.As a result – sciencein Ukraine has long been acquired characteristics of "past science", from which neither society nor the state does not receive proper benefits. Any university in the world (Harvard, Oxford, Cambridge ...) gives a much more competitive scientific production than all the universities and the Academy of Sciences of Ukraine taken together. Its conclusions authors of the publication made on the basis of given data (see. Fig. 4.1, Fig. 4.2; Table. 4.1)

Table 4.1

Commonfunding scientific research and experiments and design developments in some countries

Name of the country	Cumulative funding in % of GDP	State financing in % of GDP
Turkey	0,86	0,47
Argentina	0,65	0,49
South Africa	0,87	0,50
Italy	1,25	0,69
Russia	1,09	0,79
Canada	1,74	0,93
South Korea	4,03	1,06

Source: *The research & innovation performance of the G20,* September 2013

Figure 4.1

Academics performance of certain countries (number of scientific publications) for the period 1992-2012

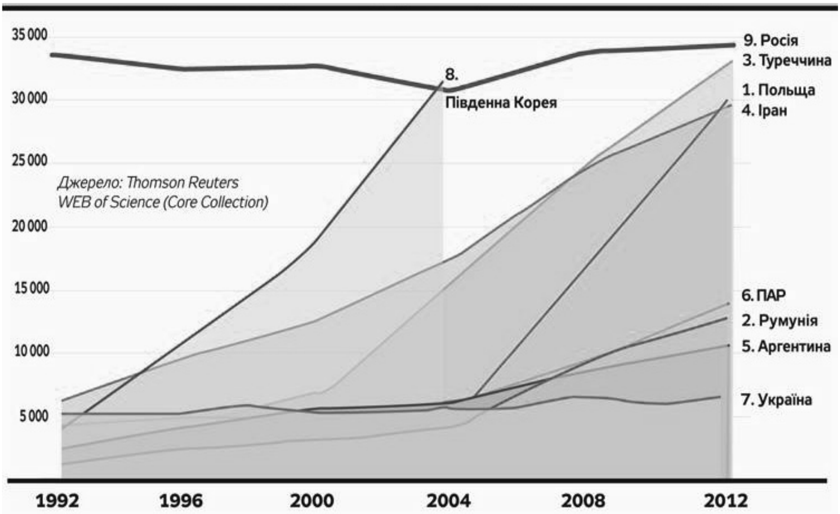
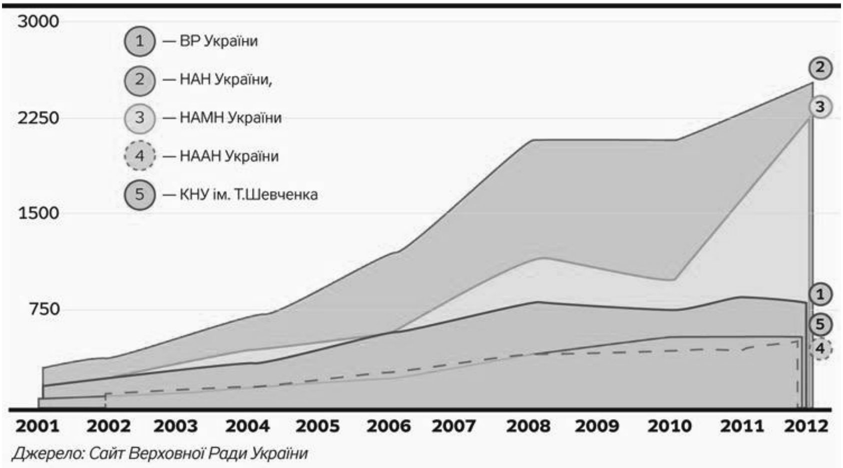


Figure 4.2

Budget funding of Verkhovna Rada of Ukraine and leading scientific organizations of Ukraine in 2001-2012, mln. UAH



And, finally, Ukraine has not enough foreign and national investors of high-tech businesses. They do not enter in this sector, because of the absence of mechanisms of innovative activity, relevant legislation and stability.

4.2.2. Innovative university as a factor in modernization of educational and research sphere and development of knowledge society

On the basis of the study we can quite confidently say that in Ukraine there are tendencies to integrate university research type with other participants of the innovative process by establishing relationships with joint activities.

Although the scope of activities of the entrepreneurial type educational institutions, their importance and place in the national innovative networks is not enough studied, some conclusions on this subject can be done. The entrepreneurial university is inherently innovative educational and scientific institution that carries out innovation [4].

The main activities of the innovative university are a scientific and educational activities based on innovative technologies and management principles.

Scientific activity of the University is a leading activity and is focused on getting new knowledge, educational – to use knowledge in the training of professionals and innovative – the commercialization of knowledge.

Educational activities of the innovative university based on non-traditional technological and pedagogical solutions, using ideas and principles of new high educational technologies that provide multiple efficiency and quality educational work.

Scientific activity in innovative university carried out within the framework of fundamental and applied researches, customers and consumers of the results which are the participants and performers in the next stages of the single innovative process of the University through an effective technology transfer of scientific results.

The main activities of the innovative university based on the following principles:

- establishment and development of the university as a subject of market relations;
- integration of academic values and entrepreneurial culture; unity of scientific, educational and innovative processes;
- strategic partnership of the university, state, academic institutions, industry and business;
- a new corporate culture of the university;
- self-examination, self-esteem and self-attestation of the university activities;
- harmonization of organizational activities of the university with requirements of system total quality management.

The strategic activities of the innovative university that determine the long-term course are:

- creating a system of innovative education and elite training;
- development of fundamental and applied researches as the basis of innovative activity;
- formation and implementation in the university full innovative cycle in the scientific and educational activities;
- support for existing and forming new scientific-pedagogical schools; creation of a balanced, adequate to the new demands of the environment of the corporate culture and internal competitive environment of the university;
- formation of a stable system in strategic partnership of university, state, industry, research organizations, business;
- creation of a reliable multi-discretionary basis for financing of the university and fundraising systems;
- creating a system of incentives for students, lecturers and university employees to integrate academic values and entrepreneurial culture;
- providing leadership at the university on national and foreign major core markets [7].

Another important moment which catches the eye in the analysis of of program documents selected for research of universities in Ukraine. Only in “Lviv Polytechnic” Development Programme for the period 2020 we find such function of the university as **promoting regional development.**

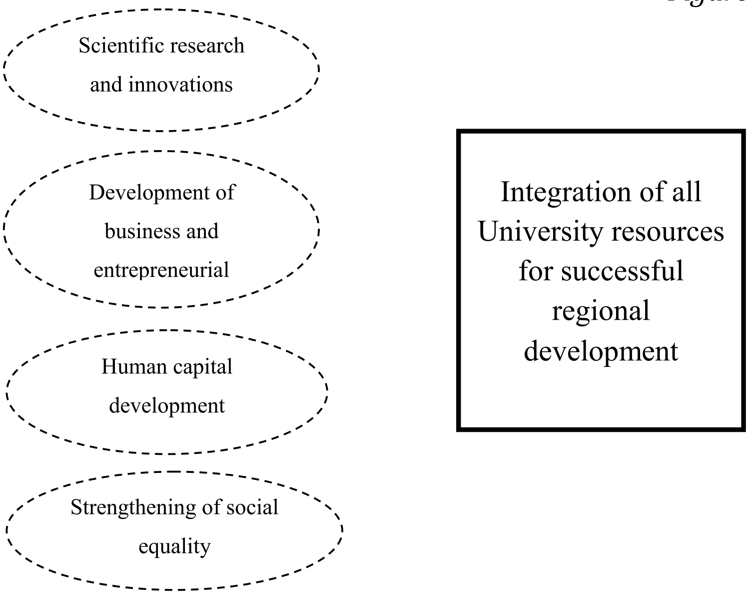
This is manifested in the formation of a separate section of the Program entitled “Monitoring of the labor market and economy development trends of state and region by industries”.

Among the activities – conclusion of agreements on cooperation with the employment foundations of western areas of the region and their implementation; monitoring group formation of regional labor market and trends of economic development of the region; organization of flexible system of specialists retraining to meet the needs of regional labor market and others.

Meanwhile, most of studies, aimed at regional development, shows how important cooperation between university and business. Increased the interest in the research role and university impact on the economic development of the regions. There are several important studies on the impact of universities on regional development, including EU study "Connecting universities to regional growth" (2011).According to the Slovak scientists research from the University of St. Cyril and Methodius (Trnava) [20], the activation mechanisms of regional development can be classified into four categories (Fig. 4.3):

1. Scientific research and innovations – improving innovative activities through research and development.
2. Development of business and entrepreneurial environment – especially in assisting of business development and growth.

Figure 4.3



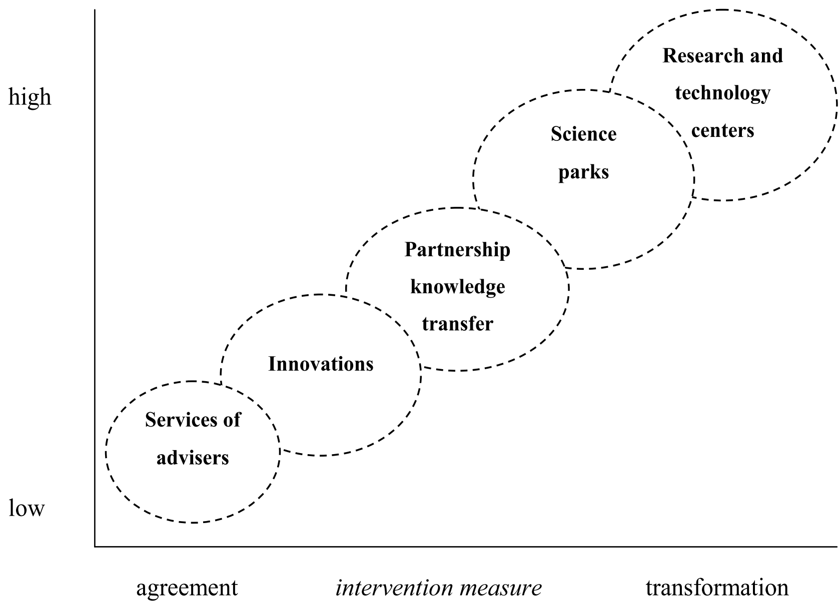
Impact of the University on regional development [20]

3. Development of human capital – through formal education within the training programs and lifelong self-education or commercial education.
4. Strengthening of social equality – with the help of regional cultural environment development.

Within this mechanism scientific researches and developments are the most important category, which the university can contribute to the development of the region. For example, inventions of economic, social and humanitarian areas can be transformed to organizational, social or environmental innovations, aimed at regional environment in which these entities operate.

Fig. 4.4: The mechanism of knowledge transformation, ranging from simple forms (consulting) to the most complex relations that are used at the level of national strategic research centers.

Figure 4.4



Knowledge transformation mechanism [20]

In the study of the impact of universities on regional development should also take into account the nature and type of region, in which universities are located.

Named Slovak scientists refered to authors Boucher, Conway, Meer, which divide universities into four categories according to their impact on regional development.

These categories were singled out on the basis of differences in the level or existence of hierarchy and competition among universities of the region. For example, universities are located in central areas, where, along a number of other traditional and new, high technology-oriented universities must cope with competitive or hierarchical relationships with other universities.

Universities and regions where they are located, the aforementioned authors divided into four categories:

1. One university in the peripheral region.
2. Several universities in the central region.
3. Traditional universities in the metropolitan area.
4. New technically-oriented universities in the central or metropolitan region.

In peripheral regions mainly can find localized only one university, which has a crucial role in connection with the generation of knowledge and its economic impact, despite the fact that he does not belong to large universities.Universities in such regions occupy a better position to create an institutional environment that provides them with the ability to actively influence regional development. Such universities in the region are almost always one of the partners in the projects related to education, research and development of SMEs and technology transfer.

The way in which universities are involved in the development of the region shows less coherent system, as in the first category. Universities in this category do not have much influence on the creation of regional networks, the importance of knowledge transfer is less. Between the universities of this type there is a great competition.

Universities in the central regions, are generally, most prestigious, oldest and focused on international markets in their countries. In these traditional universities participation in regional context is less obvious than in the previous.

According to the cited authors, the category of universities that has the greatest impact on the development of the region – is the only university in the peripheral region. Traditional prestigious universities, are typically, more focused on national and global issues than on the problems of their own region.

It follows that there are different forms of participation of universities in regional development. Most of them have a key role in science and research, education and transfer of knowledge in the business environment.

In view of the above and on the comparative analysis of programs and innovative development concepts of Universities we can make the logical conclusion: metropolitan universities (KNU, KNEU) are more focused on national and global issues than on the problems of their own region.Instead, if the university is classified as "one in the region" (peripheral areas), it plays a key role in the socio-economic and cultural development of the region.

This is particularly observed in materials relating to the development of Uzhhorod National University Strategy.

Almost in all vision versions of UzhNU for 2020, which the developers of Strategy were offered to choose, as well as determining of their version of the University mission we stumble upon the importance of UzhNU as a leading educational and scientific center of Western Ukraine, the total intellectual capacity of which allows to maintain a high level of competitiveness of Transcarpathia as leading center of higher education in the region, which plays a pivotal role in the civilizational development of Transcarpathia.

Uzhhorod National University has all prerequisites to achieve this goal. Given the 70 years of experience of several generations of scientists, geographical location of Transcarpathia and its role as a connecting link of Ukraine with the EU, favorable conditions for the development of international cooperation with universities in neighboring countries of the Visegrad Group, the achievement of the level of innovative university and integration to the European educational and scientific area becomes real.

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Part 5

INFRASTRUCTURE PROVISION OF INNOVATIVE ACTIVITY FOR HIGHER EDUCATION INSTITUTIONS

5.1.Integration of science, education and production as a way of improving the competitiveness of Ukraine

The introduction in Ukraine of the economy, which is based on the industrial use of knowledge, information and technology, is impossible without bringing into compliance with the innovative requirements of the system elements, such as:

- intellectual potential of society, vertical "science - education - production";
- a system of structural priorities;
- organizational and institutional regime;
- the physical environment of innovation;
- a system of socialization and education;
- financial principles of activities;
- adaptation to the external context of innovative transformation.

All the above gives grounds to identify the following **Priorities:**

1. The development of intellectual potential.

The development of intellectual potential of the population – the core of the innovative choice of Ukraine and a basic priority of the state policy in educational, scientific and scientific-technical spheres. Implementation and development of creative abilities of talented children and youth, complex development of the education system, promotion of research and scientific activities, encourage creative mental work, increasing social prestige of scientist and scholar – the main goals of the state towards a knowledge economy in Ukraine.

2.Integration of science, education and production.

Formation of «science-education-technology-innovation-production» system – the cornerstone of post-industrial societies development and the only possible way to improve the competitiveness of Ukraine. Through the integration of various elements of scientific, technical, educational and industrial complex, Ukraine should develop its own national innovative system as a combination of the following elements: institutions of scientific and educational sector, which creates new knowledge; regulatory and macroeconomic framework that includes, inter alia, trade policy affecting the promotion of technologies and their costs; innovative and techno production infrastructure, capable to implement innovations and turn them into goods; opportunities for access to global sources of knowledge and innovative communications; market conditions conducive to dissemination and implementation of innovations.

3. Structuralpriorities.

Restructuring of the economy provides critical to ensure the transition to an innovative model of growth and implementation of the knowledge economy. The main content of the structural maneuver is advanced growth the share of industries and production with high level of technological processing and added value, rapid capital turnover and high share of high technology component. The most significant expected economic results in terms of implementation of scientific and technological innovations at enterprises of Ukraine are:

a) efficiency and thrift use of energy and material resources;

b) increasing the share of products with high degree of processing;

c) implementation of modern management innovations and elements of logistics in production;

d) ensure flexibility of production considering the demand for innovation.

4. Organizational and institutional support of innovative processes.

The dynamic development of innovation and economic growth based on renewed infrastructure must be made by improving public management in science, technology and innovation. Innovations in the management system processes of social development – a way to improve public policy in general.

To achieve significant improvements in this direction should:

a) improve the institutional framework of the state scientific-technical and innovation policy;

b) overcome fragmentation and isolation among educational and research institutions;

c) centralize state policy in the sphere of innovations within the single competent authority of executive power;

d) enhance the status of the Council for Science and Technology Policy under the President of Ukraine, to develop a mechanism of strict implementation of its decisions;

e) form a nationwide system of automated search, collection, accumulation, analytical processing and storage, distribution and the provision of information in the field of scientific, technological and innovation development;

f) improve the system of public funding of innovative processes, the mechanisms of state orders in science and technology sphere, as well as monitoring the effectiveness of the financing and implementation of research and innovation projects.

5. Development of innovative oriented education.

To ensure effective implementation of the innovative strategy of Ukraine it must be created a mechanism for determining the need for specialists to form a state order for training, which must be based on full forecast-analytical studies.

6. Improving financing efficiency of innovative processes.

Streamlining the system of innovative processes financing is the main prerequisite for increasing the effectiveness of public policy in this area and guarantee the effectiveness of building a knowledge economy in Ukraine. To improve the effectiveness of the innovative processes funding system, it is necessary to carry out:

a) introduction and development of competitive principles in the allocation of funds for scientific and educational programs and projects, the involvement of independent public organizations to control the use of the funds;

b) improvement of national legislation on the creation of integrated industrial-financial groups (holdings, corporations) to encourage the integration of innovative resources and investment capital;

c) development of measures to attract domestic banks in lending to population education and a significant expansion in the number of credit and financial companies involved in lending to innovation, acceleration of creation of innovation-oriented banks;

d) consideration of the prospects of reforming the system of financing scientific institutions by implementing a two-tier system of financial security: basic funding (retention of material resources, utilities);grant funding on a competitive basis through public research funds, as well as special fund;

e) improving the mechanisms of state order for innovative products;

f) creation of the special state funding for scientific and technical programs and innovations.

7.Strengthening of international cooperation in education, science, technology and innovative spheres.

International cooperation in education, science, technology and innovation – is not only an important direction of foreign policy, but also the main means for attracting and adaptation of Ukraine to modern achievements of science and technology, basic humanitarian component of social integration. To strengthen the international direction of integration, first of all, it is necessary to:

1) provide funds for the participation of representatives from Ukraine in relevant international events (conferences, seminars, round tables) and increase the discipline in use of these funds;

2) introduce development monitoring of global events, infrastructures and education, science and technology and innovation spheres;

3) attract Ukraine to strategic international projects and programs that are implemented now, and to avoid a failure to include Ukraine to regional and continental educational research and innovative projects in the future;

4) accelerate the adaptation of standards in the national educational system according to the EU criteria.

8.Regionalization of innovative and science and technology policy.

Innovative regional development and regional innovation policies are crucial in terms of providing practical tasks of modernization of Ukraine. Stimulation of infrastructure renewal processes and integrated socio-economic development areas – one of the main strategic objectives of Ukraine innovative strategy, which envisages:

1) deepening integration of regional educational and scientific infrastructure by strengthening linkages between regional centers and offices of National Academy of Sciences of Ukraine and other branch academies, research institutes, academic institutions and enterprises;

2) stimulate creation of «academic innovative zone» around the National Academy of Sciences and its regional centers, which should consist of enterprises that implement the scientific development to production;

3) increasing the number of companies implementing innovations by providing «local preferences» (incentives which initiates local authorities), strengthening innovation and modernization component of the privatization process, the introduction of regional innovative priorities system;

4) introduction of «innovativeness» as one of the main criteria for statistical evaluation of regional development and the practice of periodic statistical reports on indicators of regional innovative development;

5) promoting the development and implementation of regional programs for innovative policy in Ukraine elaborated on the basis of leading regions experience.

5.2.Technology transfer as the main mechanism for combining scientific and technical and production activities

The main mechanism of combining scientific and technical activities with production is technology transfer – the process of transfer new ideas, technologies or development in use. Regulatory and legal framework in the field of technology transfer in Ukraine is not "the unploughed virgin soil". Back in 2006, was adopted the Law of Ukraine "On state regulation of activities in technology transfer" [16], intended to ensure the effective use of scientific, technical and intellectual potential of Ukraine, technological production, protection of property rights for domestic technologies and / or components on territory of states where it is planned or carried out their use, expansion of international scientific and technical cooperation in this area. In pursuance to this Law of Ukraine, were approved necessary regulations for implementation of this Law. However, effectiveness of technology transfer in Ukraine is still not high.

Research shows that the domestic market of high technologies is actually under the control of non-governmental organizations. Scientific developments created by public funds, mostly commercialized without any compensation to the state. Do not ensured protection of property rights in technology and facilities. There are no incentives for the development of priority technologies and their introduction into production. An important step towards resolving these problems should be the implementation of the Law of Ukraine "On state regulation of activities in technology transfer," adopted by the Verkhovna Rada of Ukraine on September 14, 2006. This law defines legal bases of state regulation activities, also in the area of property rights to domestic technologies on the territory of states. In the Law makes the definition of technology transfer as the transfer of technology, which is made by concluding bilateral or multilateral agreement between the physical and / or legal persons which are established, modified or terminated property rights and responsibilities for technology and / or its components.

The main purpose of state regulation activities in the field of technology transfer the Law provides ensuring the development of national Industrial Research and Technical capacity, its effective use for solving the tasks of socioeconomic development of the country and providing technological production of domestic products on the basis of international experience, possible socio-economic, technological and environmental consequences of the use of technology and their components, promote development of production, which uses the latest domestic technologies.

To ensure the implementation of provisions of the Law of the Ministry of Education and Science of Ukraine jointly with the State Property Fund of Ukraine, National Academy of Sciences of Ukraine and other central executive authorities were developed a number of regulations that are in accordance with established procedure were introduced to the Cabinet of Ministers of Ukraine and adopted by it. The Resolution of the Cabinet of Ministers of Ukraine "Some issues on implementation of the Law of Ukraine "On state regulation of activities in technology transfer" of August 1, 2007 No. 995 approved Model provision on the structural subdivision for technology transfer, innovative activity and intellectual property.

The experience of developed countries shows that a powerful catalyst for attracting businesses to the innovative activity serves a system of institutions for infrastructure ensuring of innovative activity, designed for more rapid and effective implementation of innovative projects, the composition of which is conditioned by economic, cultural, political, social and other features of the world. In order to create innovative infrastructure in Ukraine the Ministry of Education and Science of Ukraine developed, and the

Resolution of the Government of 14.05.2008 No. 447 approved the State target economic program "Creation of Innovative Infrastructure in Ukraine" for 2009-2013. The program determines optimal solution to the problem of creating organizational and economic conditions that effectively influence the increase of innovative activity and competitiveness of the country economy, implementation of technological breakthroughs and ensure formation of constant need for the development and implementation of innovation, effective use of research and technical, innovative and educational potential in the public interest. Program defines the minimum number of innovative structures creation and activities of which will provide appropriate assistance to innovators at all levels. Along with public funds to finance its activities will be involved local budgets and off-budget sources. The share of the state contribution is about one third of its total funding. Therefore for successful implementation of program activities it is important that the state fulfilled its obligations, that will confirm to other potential investors the importance of this area for its business.

In accordance with the objectives of the National Action Plan for 2012 [25] the Cabinet of Ministers of Ukraine adopted the Resolution of 10.09.2012 № 691-p "On Approval of the Concept of reforming the state policy in innovative sphere" [27]. The aim of this Concept is to improve the fundamentals of state regulation in the sphere of innovations, economic development, structural and organizational bases of innovative activity, ensuring interaction of various institutions during the implementation of innovation, creating a system of state support of innovative development of national economy, creation of the technology and innovation modern market, determination of mechanism of rapid response to changes in the innovative sphere. Pursuant to paragraph 2 of this Resolution the State Agency of Ukraine on e-governance together with interested central executive bodies, National Academy of Sciences of Ukraine and sectoral National Academy of Sciences prepared a draft Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Action Plan on realization of the

Concept of reforming the state policy in innovative sphere for the period to 2014." [19].

Measures aimed at clarifying the tasks and functions of the executive and local authorities in innovative sphere and the provision of legal principles creating local state administrations of structural subdivisions on innovative development. A number of measures aimed at creating favorable conditions to enhance innovative activity, introducing innovations, operation of innovative infrastructure, innovation and technology market by improving the legal principles of technological parks functioning, facilitating the creation and ensure the operation of technology platforms, facilitation in creation of innovative clusters and small innovative enterprises.

To simplify and clarify the procedure of state registration of innovative projects the Resolution of the Cabinet of Ministers of Ukraine of 06.06.2012 No. 573 [15] amended the Procedure of State Registration of innovative projects [18], including provides consideration of innovative projects on a "single window" and reduced the timing of their state registration.

5.3.The system of innovative infrastructure

Cabinet of Ministers of Ukraine back in 2008 adopted State target economic program "Creation of Innovative Infrastructure in Ukraine" for 2009-2013 [18]. This program aims to facilitate the creation of an extensive infrastructure of innovative activities at both the national and regional levels. It also includes academic and university science, small business. Program objectives and activities aimed at:

- development of infrastructure to support small innovative businesses;
- formation of an information and consultation support of innovative activity;
- creation in higher education institutions an integrated system of infrastructure provision for innovative activity;
- creating an extensive innovative infrastructure based on research institutions;

- creation of infrastructure for financial provision of innovative activity;
- creation of assurance systems for innovative activity at regional level with ensuring the inter-regional coordination of its development;
- providing systematic training and advanced personnel training in intellectual property sphere, technology transfer and innovative activity;
- creating the legal and methodological framework and development of mechanism for support and development of various types of enterprises and organizations of innovative infrastructure.

In 2012, the absence of financing of this Program from the state budget, the implementation of its activities implemented mainly at the expense of local budgets and other involved funds. In regions of Ukraine in the implementation of program is already established and create new business incubators, science parks, business centers to support small and medium enterprises, technology transfer centers, clusters and more.

The effectiveness of this operation is not high, stimulated by imperfect legal mechanisms and lack of coordination between different branches of legislative acts. Furthermore, until the appropriate legal tools in Ukraine are absent or insufficient, that would contributed the development of innovative business incubators, innovation development centers, technology transfer centers, venture funds and other organizational forms that generally form the infrastructure of the national innovative system.

The question related to the definition of innovative legal entities and their legal status, is key in developing the mechanism of legal regulation of national innovative system. As regards the legal analysis of gaps in the legislative regulation, compliance of legislation acts and assess their efficiency can be noted.

Subject to the provisions of Art. 1 of the Commercial Code of Ukraine (CC Ukraine) and Art. 5 of the Law of Ukraine “On innovation activity”, provisions of the Cabinet of Ministers of Ukraine

“On Approval of the Concept of development of national innovation system” and other legal acts of Ukraine can be distinguished such participants of innovative relations:

- subjects of innovative activity that are parties to innovation and production, organizational and innovative and internally-innovative relations;
- subjects of innovative infrastructure;
- public authorities and local governments, and other entities endowed with regard to business entities innovative activity organizational and economic competence in the field of innovation;
- holder of proprietary rights of intellectual property, which provide input of economic turnover and the ability to implement them as innovations.

5.3.1. Ministry of Education and Science of Ukraine as central body in the sphere of innovative activity

Ministry of Education and Science of Ukraine according to current legislation – is the main (leading) central executive body in the field of research and technical and innovative activities which together with other executive authorities should create favorable legal conditions for realization of innovative activity.

Result of the work in this field for today is the improvement of legal framework for governing activities of innovators, implementation of measures aimed at developing the innovative infrastructure, organization of civilized technology transfer in order to create conditions for the development and effective use of innovative potential of the state, improving product competitiveness. Improving the legislative and regulatory framework in the field of innovative activity and technology transfer is a major priority for the ministry.

At the same time not all acts of the Ministry aimed at supporting the development of innovative infrastructure, so the Law of Ukraine “On Amendments to the Law of Ukraine “On the State

Budget of Ukraine for 2005"" [14] and some other legislative acts of Ukraine was completely abolished indirect state support of technology parks for projects performers that hindered the further development of technology parks and significantly reduced the number of innovative projects implemented by technoparks. The consequence of this not carefully decision was failure to comply approved business plans of innovative and investment projects (which, incidentally, were agreed by the Commission with the organization activity of technological parks and innovation structures of other types), the loss for performers of innovative projects an opportunities to pay for purchased equipment and performed scientific and research and design work in time, the loss of confidence of foreign and domestic investors to the stability of legal framework in the sphere of innovative activity and refusal to participate in the financing of innovative projects. Keeping a high rate of production and sales of innovative products, technology parks during 2005-2007 did not started the implementation of any innovative project. Only at the end of 2007 was registered the first from the 2005 innovative project.

In order to fix this situation, the Ministry developed a new version of the Law of Ukraine "On Special Regime of Innovation Activity of Technological Parks" which restored partly tax and customs privileges for performers of the projects (on payment of income tax and on deferred term of payment of customs duties on import of new equipment, and components, and materials that are not produced in Ukraine). The new edition of the Law adopted by the Verkhovna Rada of Ukraine on January 12, 2006. The law defined a special regime of innovative activity, which provided state support of technological parks activity, their participants and joint ventures when implementing projects in the priority areas of technological parks. Today adopted a series of regulations aimed at ensuring the implementation of of this Law, including:
– Resolution of the Cabinet of Ministers of Ukraine dated 29.11.06 No. 1657 "Some aspects of the organization of technological parks activity", which approved a new procedure for the state registra-

tion of technology parks and amended the procedure of review, examination and state registration of technological parks projects and provisions on the procedure of review and approval of priority activities of the technology park; – Resolution of the Cabinet of Ministers of Ukraine dated 23.11.06 No. 1643 "On Approval of the procedure of inclusion of corporate income tax on special accounts of the technology park, its participants and joint ventures, the use of these funds and control over their use", in pursuance of provisions prepared joint Order from 10.01.07 No. 3 of the Ministry of Education and Science, Ministry of Finance and the Main Control and Revision Office on approval the plan of use of funds tax amounts, credited to the special accounts of technoparks by the order of MES from the 24.02.07 No. 153 approved the report forms on intended use of tax amounts credited to the Special Account; – Resolution of the Cabinet of Ministers of Ukraine from 21.03.07 No. 517 "On approval of the Procedure of monitoring and exercise control over implementation of projects of technological parks", where defined the verification mechanism of technology parks activity by controlling and monitoring, first of all – uses of special accounts funds of technoparks and performers of the projects according to the Law of Ukraine "On Special Regime of Innovation Activity of technological parks", budget efficiency of technoparks projects, declared objectives in the business plans actually received results and the verification of the effective use of targeted subsidies funds, credited to special accounts of technoparks their participants and joint ventures.

Among the main problems identified in the practical application of the special regime of innovative activity provided by the Law of Ukraine "On Amendments to the Law of Ukraine "On Special Regime of Innovation Activity of technological parks" from 01.12.06 No. 3333 IV is unclear of its individual provisions and ambiguous application of its norms by central executive authorities.

During the implementation of technological parks projects there is a need to amend them in the emergence of new, more efficient equipment and the corresponding change in technological solutions embedded in projects. In order to resolve this problem the Cabinet of Ministers of Ukraine on November, 8 2007 adopted the Resolution No. 1310, developed by the Ministry of Education and Science of Ukraine, which amended the procedure of consideration, examination and state registration projects of technological parks. The Resolution provides in particular opportunities amending the technology park project in case of changing the nomenclature of goods necessary for its implementation, provided that this does not lead to an increase in the total value of imports.

To determine the competence of each ministry and departments involved in the preparation of general conclusion of the project and development of the technology park and its innovative projects in determining the appropriateness of their state registration, Ministry of Education and Science of Ukraine developed and approved by orders in consultation with central executive authorities “The criteria for project evaluation and development of the technology park” (from 10.07.07 No. 593) and “Selection criteria when making projects of the technology park” (from 10.07.07 No. 594).

To ensure active participation of technological parks in drafting regulations, developing proposals to improve conditions of innovation and mechanisms for the implementation of innovative projects at the Ministry of Education and Science of Ukraine established the public Council of heads of technoparks, the composition of which is approved by the Ministry of Education and Science of Ukraine from 16.10.07 No. 913. In its activities the Council is guided by the Regulations on Public Council of Heads of technoparks, approved by the Ministry of Education and Science of Ukraine from 19.11.07 No. 1019. The main objective of the Council is to establish effective cooperation between technoparks and ministry in creating favorable conditions for their activities. Establishment of the Council aimed at ensuring the openness of the Ministry activity, consideration of public opinion in the preparation and organization of its decisions in the field of innovative activity.

5.3.2. Technoparks

Today's problem is not to increase the number of technology parks, but in intensifying their activities by introducing incentives, including tax, which proved to be effective in 2000-2004. Because of what the State Agency of Ukraine on e-governance developed a draft Law of Ukraine "On Amendments to the Law of Ukraine "On Special regime of Innovation activity of Technological Parks". The draft law is aimed at the revitalization of technological parks, encouraging the implementation of innovative projects as well as a clear definition of the mechanisms of certain provisions of this law. The draft Act provides:

- simplification of registration procedures for technology parks;
- determining grounds for establishing duration and sequencing of a special regime for industrial parks innovative activity during projects implementation;
- changing the mechanism of state registration of projects technology parks and grounds for cancellation of the state registration;
- strengthening control and responsibility for projects implementation of technological parks, as well as the use of a special account allocated to implementation of Technopark projects;
- changes to the terminology used in the law.

Today, especially, there are problems associated with determining the legal nature of the technology park. In the scientific literature there is no single view on whether it should be attributed to the subjects of innovative activity (ie. those structures that develop, produces and distributes innovative products and (or) products or services) or to the subjects of innovative infrastructure (as agencies that provide services (financial, consulting, marketing , information and communication, legal, educational, etc.) with the provision of innovative activity, that do not create their own innovative products / products, etc.).

There is no unity in the definition of the technology park nature and in the existing regulations. In particular, the Law of Ukraine "On innovation activity" [22] include technology parks to innovative enterprises, ie those structures that develop, produces and distributes innovative products and (or) products or services, that is, to the subjects of innovative activity. At the same time according to the Concept for development of the national innovation system (Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Concept for development of the national innovation system" [27]), the technology park along with scientific parks, technopolis and business incubators etc. include to the subjects of innovative infrastructure.

There is also no unity in the definition of the legal form of the Technopark. Thus, according to the Law of Ukraine "On innovation activity", the Law of Ukraine "On Special Regime of Innovation Activity of Technological Parks" [28], the Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Procedure of creation and functioning of technology parks and innovation structures of other types" [20] the technology park is either a legal entity (innovative enterprise) or a structure that is created by a group of entities that operate under the joint venture agreement. At the same time according to Art. 403 of the Commercial Code of Ukraine and Art. 3 of the Law of Ukraine "On general principles of creation and functioning of special (free) economic zones" [17] the technology park in general is positioned as one of the types of special (free) economic zones. That is all as an area with special activities.

There are problems associated with the installation of legal capacity of parks. Since the Law of Ukraine "On Special Regime of Innovation Activity of Technological Parks" this issue is not dedicated to a single word, it gives grounds for recognition of technoparks total legal capacity under the terms defined by the Civil Code and Commercial Code of Ukraine.

There are problems associated with this form of technopark activity as a group of persons acting under the joint venture agreement.

First, in case of choosing this form of organization of the technopark activity, according Art. 55 of the Commercial Code of Ukraine can not be recognized as business entity.

Secondly, according to the Law of Ukraine “On Special Regime of Innovation Activity of Technological Parks”, the agreement on joint activity of Technopark participants remained unregulated number of important issues. Among them should be mentioned the lack of legal grounds consolidation for a possible termination of the technology park activity and its liquidation, as well as liquidation procedure of the Technopark. However, the latter aspect classified according to P. 2, Art. 1 of the Law at the discretion of the technology park participants themselves and should be determined in the agreement on joint activities.

Do not set the legal consequences of the termination of the joint venture agreement, if such legal fact comes before the end of the period of performance of registered technology park project. At the same time would be desirable to note that the logic of the law is should lead to the elimination of technology park, but directly this situation is not resolved, that can not be considered acceptable, given the role of technology parks, which confers on them by the state to stimulate the process of research and innovative development.

In addition, the contractual relationship between the participants of technopark not limited only the joint venture agreement – in general, they are complex, as supplemented by a variety of transactions in the project. As a result, between them composed “multilayer” relationship, which, however, are interrelated and create a systemic unity for the successful implementation of innovative project.

A special form of technopark as a group of business entities without legal entity status causes the need to legal definition of issues related to liability for the obligations of the technopark participants in the project. Furthermore it is advisable to consolidate the rule about saving commitments of technopark participants in case of a member exit from the technology park (withdrawal from the joint venture agreement) before the end of the project, pursuant to which a contract has been concluded.

Another gap in the streamlining of technology parks serves the absence in the law of provisions on the distribution of rights to intellectual property and innovative products among participants of technopark.

The Law of Ukraine "On Special Regime of Innovation Activity of Technological Parks" in its Preamble says that it defines the legal and economic principles of implementation and operation of the special regime of innovation activity in technological parks.

This regime is actually defines obtaining by technoparks, their participants and joint ventures of certain favorable conditions for their innovative activity. According to the P. 1, Art. 3 of the Law the special regime of innovative activity introduced for technology park for 15 years and operates in the performance of its projects.

However, this regime de facto applies not to all activities of technology parks, their participants and joint ventures – it only applies to the conditions of specific, registered project of the Technology Park. In other words, the special regime provided not innovative activities of technology park and performers of its project in general, but only the relevant project which was examined and which received a certificate of state registration. And so in fact it should mentioned not on special regime of technology park innovative activity but about special regime of implementation a specific innovation project.

This provision has not changed and in connection with the adoption of the Tax Code of Ukraine [10].

Also, can not pay attention to the existing legislative inaccuracies, gaps and conflicts associated with the establishment of a special regime of innovative activity for technology parks. Thus, registration of technology parks falling within the competence of the central executive body on science, but the reason for this inclusion is recognized in the list of technoparks, defined in the preamble of the Law of Ukraine "On Special Regime of Innovation

Activity of Technological Parks", which actually means the need for changes to the law, and this is the competence of the Verkhovna Rada as the supreme legislative body of the state. In other words, provision on the competence of technology parks registration is ambiguous. These issues are partially resolved at the level of subordinate normative and legal regulation [26].

In addition, the use of a special regime in terms of implementing innovative projects of Technopark limited to 15-year term. However, the certificate of registration of the technopark project, which is the basis for introducing a special regime, applicable during the period of technopark project implementation, but not more than 5 years. It should be noted that the above-mentioned Law of Ukraine does not provide the possibility of extending validity of the certificate or obtain new in case if actual period of project implementation exceeds five year term, and the term of technology park activities is not yet exhausted.

Also, according to the provisions of the Law, implementation of innovative projects can be carried out not only by the technology park itself, but also through joint ventures and by attracting of co-producers and manufacturers of products. However, the above mentioned Law actually missingthe establishment of legal status for this category of entities involved in the technology park project, not defined the legal basis of their participation in the project.

In general, the presence of the above problems, well as the fact that the normative and legal acts governing the technology parks activities, repeatedly have been made numerous changes and additions, which then canceled, and then again renewed provided by these structures benefits, does not contribute to the normal and proper functioning of these subjects.

Throughout its existence, the model of technology parks has undergone certain evolution. The feature of the early models of science parks was the existence of only one founder and the main activity was the provision of own land on lease to innovative companies. The modern model of scientific and technological parks provides several founders, which complicates the management mechanism, however, is more effective, particularly in raising capital. Another distinguishing feature of the new model is the presence of technology park conditions for the placing on its territory a large number of small businesses, which contributes to a large number of small and medium-sized companies engaged in scientific and technological activities and have access to using the system of collective services and communication with the local university or research center. Thus, according to the International Association of science parks, close connections between client companies and universities with the creation of scientific and technical groups exist in most technology parks of the world – 72%.

Table 5.1.

Characteristics of the main development stages of technology parks in the world

Characteristic feature of the stage	**Development stages of the technology parks**		
	Phase1 (1947-1970)	***Phase2 (1971-1985)***	***Phase3 (1986-2011)***
1. The dominant form of the technology park	University technology park, regional branch technology park, scientifical town	Mega Technopark (technopolis), technological incubators, specialized technology parks, technology transfer centers	Network technology park, technology parks associations
2. Main characteristics of the dominant forms of technology park	Created at universities	Created as regional structures, targeted by industry	Created as a platform for communication
3.The basic process	Conducting of scientific and research developments	The commercialization of scientific and research developments	Creating a space for information exchange, joint projects

4. Core	University laboratories, complex design and research bureau of multinational corporations	Office complexes of technological business incubators	Virtual networks, networks of the technology parks departments
5. Owners of the park	Universities, multinational corporations	Office complexes of technological business incubators	Virtual networks, networks of the technology parks departments
6. Product of the technology park	Innovative product	Technological solutions and technologies	Scientific and research potential
7. Basic service of the technology park	Access to knowledge source (higher education institution) or source of practical tasks (company)	Favorable conditions (real estate business), advanced related services	Access to the professional community
8. Countries Leaders	USA, Great Britain	Europe, Asia	USA

5.3.3. Science parks

An important place in the group of legislative acts, which define the basic principles of innovative development of the country, take the Law of Ukraine «On innovation activity» of 04.07.2002 No. 40-IV and the Law of Ukraine "On Priorities of Innovation Activities in Ukraine" No. 3715-VI of 08.09.2011. The Law of Ukraine «On innovation activity» defines the objects and subjects of innovative activity, types and sources of financial support, procedure of creation and activities in the field of innovative public financial and credit institutions, the purpose and principles of the state innovative policy. The Law of Ukraine «On priorities of innovation activity in Ukraine» defines the legal, economic and organizational principles of formation and realization of priorities of innovative activity in the country. For the main purpose is to create the legal basis for the concentration of resources in the leading areas of scientific and technological renovation of production and services, ensuring the domestic market competitive by high-tech products and output it to world markets.

Current normative documents are the Resolution of the Verkhovna Rada of Ukraine «On recommendations of parliamentary hearings on the topic: «The Strategy of Innovation Development of Ukraine for the period of 2010-2020 under conditions of globalization challenges» No. 2632-VI of 21.10.2010, in particular, it highlighted the need for:

- creation of enlarged regional universities, turning them into powerful educational and scientific innovative centers;
- changes in approaches to the formation of state order for training specialists with higher education, including highly qualified personnel on innovative activity (management, marketing, finance, commercialization);
- creation of a single scientific and educational training mechanism for innovative sphere;
- state support for young people, which passes education and training in leading foreign universities and research centers of the areas of innovation;
- improvement of education and research infrastructure and conduct basic and applied scientific research in higher education institutions, implementation of research results in the educational process;
- full support of scientific and technical activities for the further development of science in leading higher educational institutions, update their material and technical base, including through the ensuring modern high-tech knowledge based equipment, development of structure for innovative activity and technology transfer for the

implementation of scientific and technological developments;

– development of innovative infrastructure in Ukraine: innovative business incubators, innovative development centers, technology transfer centers and other organizational forms for infrastructure provision of innovative activity, combining science, production and business, including through the provision of state support.

The state of science and technology and innovative spheres has repeatedly seen by the National Security and Defense Council of Ukraine. In particular, after the meeting of the National Security and Defense Council of Ukraine of April 6, 2006 the President of Ukraine issued the Decree of July 11, 2006 No. 606/2006 "On the decision of the National Security and Defense Council of Ukraine of April 6, 2006»On the state of scientific and technological sphere and measures to ensure innovative development of Ukraine», one of the objectives, set out in this document, was to develop the Concept of national innovation system development and action plan for its implementation. The Concept of national innovation system development was approved by the Resolution of the Cabinet of Ministers of Ukraine «On Approval of the Concept of national innovation system development» of 17.06.2009 No. 680-p.

Scientific and Research Parks recognized as one of the most important structure towards commercialization of innovations, their activity is regulated by the Law of Ukraine «On Scientific Parks» [4]. This law regulates the legal, economic, organizational relations connected with the creation and operation of science parks, and is aimed at intensifying the processes of development, implementation and production of innovative products on the domestic and foreign markets.

Under this law the Science Park is a legal entity which is formed on the initiative of higher education institution and / or research institution by joining of the founders contributions to the organization, coordination, control and process of development and implementation of Science Park projects. Science park created for the development of science, technology and innovative activities in higher education institution and / or scientific institution, effective and efficient use of the existing scientific potential, material and technical basis for the commercialization of research results and their introduction on the domestic and foreign markets.

The main functions of the Science Park are:

- creation of new types of innovative product, implementation of measures for their commercialization, organization and ensure the production of high technology, competitive on domestic and foreign markets innovative products;
- information and methodological, legal and consulting providing of the scientific park partners and founders, providing patent licensing assistance;
- involvement of students, graduates, graduate students, researchers and employees of higher education institution and / or research institutions to develop and implement science park projects;
- to promote and support of innovative small businesses;
- organization of training, retraining and advanced training of specialists, necessary for the development and implementation of the science park projects;
- attract and use in their work risk (venture) capital, support for high-tech industry;
- protection and representation of interests of the founders and partners of the science park in public authorities and local governments, and in relations with other business entities during the organization and implementation of the Science Park projects within the limits set by the constituent documents of the Science park;
- development of international and domestic cooperation in science, technology and innovation, promoting foreign investment;

- perform other functions allowed by the legislation of Ukraine.

The list of priorities of the science park is formed under the Law of Ukraine "On Priorities in Innovation Activities in Ukraine" (433-15) in accordance with the directions of scientific activity of higher education institution and / or research institutions to the needs of the region (territory), where the science park located. Under this Law the strategic directions of innovative activity by 2021 include:

1) mastering of new technologies of energy transportation, implementation of energy efficiency, resource saving technologies, development of alternative energy sources;

2) exploring of new technologies of high-tech development of transport system, rocket and space industry, aviation and shipbuilding, armament and military equipment;

3) development of new production technologies, materials, their processing and interconnection, creation of nanomaterials industry;

4) technological innovation and development of agriculture;

5) introduction of new technologies and equipment for quality health care, treatment, pharmaceuticals;

6) widely used of technologies of cleaner production and environmental protection;

7) development of modern information, communication technologies, robotics.

According to this conception of national innovative system development – a national innovative system – is a combination of legislative, structural and functional components (institutions) involved in the creation and application of scientific knowledge and technology and determine the legal, economic, organizational and social conditions for the innovative process.National innovation system includes subsystems:

1) government regulation, consisting of legislative, structural and functional institutions that establish and ensure the observance of rules, regulations, requirements in innovation and interaction of all subsystems of the national innovative system;

2) education consisting of higher educational establishments scientific-methodological and methodical institutions, scientific and industrial enterprises, state and local education authorities and educational institutions that conduct training, retraining and advanced training of staff;

3) knowledge generation, consisting of scientific institutions and organizations regardless of ownership, conducting research and development and create new scientific knowledge and technology, public research centers, academic and branch institutes, research departments of higher education institutions, research and design units of businesses;

4) innovative infrastructure consisting of production-technological, financial, information-analytical and expert consulting component, and also with technopolises, technological, industrial and science parks, innovative centers and technology transfer centers, business incubators and innovative structures of other types; information networks of scientific and technical information, expert consultancy and engineering firms, public and private institutional investors;

5) production, composed of organizations and enterprises that produce innovative products and provide services and (or) are consumers of technological innovation.

The purpose of the development of national innovative system is creating conditions for increasing the productivity and competitiveness of domestic commodity producers through technological modernization of the national economy and raising their innovation activity, production of innovative products, the use of advanced technologies, methods of organization and economic management to improve human well-being and ensure sustainable economic growth.

Science park created and operates according to the Commercial and Civil Codes ofUkraine [9,10], the laws of Ukraine «On Higher Education», «On investment activity», «On scientific and technical activity», «On innovation activity», «On State Regulation of Activities in the Sphere of Technology Transfer» and other regulations. It is with the Commercial Code of Ukraine funneling possible business associations of the science park founders, namely:

Association – contractual union set up for the purpose of permanent coordination of economic activity of enterprises, united by one or more centralized production and management functions, specialization and cooperation development of production, organization of joint production based on the association of financial and material resources mainly meet the economic needs of association members. The Association has no right to interfere in economic activity of enterprises – participants of association.

Corporation – contractual union set up through a combination of industrial, scientific and commercial interests of of enterprises that have teamed up with the delegation of their certain powers for centralized regulation of activity of each member by management bodies of the corporations.

Consortium – a temporary charter union of enterprises to achieve by its participants certain joint economic purpose (implementation of target programs, scientific, technical, construction projects, etc.). The consortium uses the funds from members, centralized resources, allocated to fund appropriate programs, and funds coming from other sources in the manner specified by the charter. If a goal of its creation achieved, the consortium ceases to operate.

Concern – charter union of enterprises and other organizations based on their financial dependence on one or a group of union participants, with centralized functions of scientific, technological and industrial development, investment, financial, foreign trade and other activities. Participants of the concern give it a part of their powers, including the right to represent their interests in relations with authorities, other companies and organizations. Participants of the concern may not simultaneously be members of the other concern.

The main purpose of science parks is to determine, disclosure and development of innovative potential of the country, its regions, ensuring the needs of the economy in innovative products through the formation within them favorable conditions for the commercialization of research. Due to creation within science parks an appropriate financial and technological conditions for the implementation of innovative projects, management support of scientific and technological development, protection of intellectual property of the author technical solution can maximally remove obstacles in the path of development from the idea to its realization.

5.3.4. Venture funds

Under the current legislation of Ukraine the venture funds are part of a system of joint investment institutions, introduced by the Law of Ukraine "On Joint Investment Institutions" [23]. According to this Law, a venture fund – is a non-diversified collective investment institution (hereinafter – CII) closed type, which carries exclusively private (closed) placement of CII securities among legal entities and individuals. The current situation shows that working in Ukraine venture funds do not perform the functions which are inherent to them in the international practice.

However for the full operation of venture funds in Ukraine should introduce a series of organizational and legal measures. So, to attract investment of venture enterprise not only legal, but individuals must be created a system of appropriate guarantees from both the state and the municipal authorities and introduce incentive mechanisms of tax benefits that are currently not clearly outlined in the Tax Code of Ukraine [10].

Another direction of potential expansion of innovative projects investors' is the creation of economic and legal, organizational and legal conditions to attract investment of pension funds.

Current legislation of Ukraine does not provide for participation in venture funds of such institutional investors, which act as insurance companies and pension funds, and the network itself of pension funds in the country is not sufficiently developed, and activities of most private pension funds, as well as the functioning of venture funds in general, does not focus only for the implementation of the investment features of these tools to obtain investment income, as used for speculative schemes of property management and optimization of the tax burden of the participants.

To ensure liquidity of venture business it is necessary to have not only developed stock market but also other feasibility shares of innovative enterprises, unknown to wide circular of customers. For this purpose, borrowing the experience of other countries, it is advisable to create the Ukrainian association of exchange dealers with automatic system of quotation, which will conclude agreements via telecommunications system throughout the country.

There is also a topical need to create an effective mechanism to stimulate venture investment by funds of local budgets with the prospect of a network organization for regional venture funds that would provide new companies not only financial support but also committed to high-quality comprehensive curator of their activities. The real sources of venture investment business could be the funds of the development Bank.

An interesting form of incentive risk funding is the possibility of providing state guarantees for investment by venture funds of small businesses in small technology firms.

The activities of venture structures as fundamentally new organizational form of accelerating scientific and technological progress, closely related to the totality of relations in the field of intellectual property.Experts emphasize that the fundamental importance is the resolve the issue of joint ownership of intellectual property between employer and employee. In this regard defined another reason, which demonstrates the necessity of the enactment of the Law “on service” objects of intellectual property, ie the objects of intellectual property created in the performance of the employment contract.

5.3.5. Centers for Technology Transfer

The legal status, tasks and the functioning of technology transfer centers identified by the current legislation of Ukraine.

The basic law is the Law of Ukraine «On state regulation of activities in technology transfer» No. 143-V of 14.09.2006. [16], and Resolution of the Cabinet of Ministers of Ukraine «Some issues in implementation of the Law of Ukraine «On state regulation of activities in technology transfer» [6].

It should be noted also that until the activity in Ukraine on commercialization of intellectual property created both within the universities, and within academic institutions, yet has not become a common practice. At first only a few educational institutions on its own initiative implemented similar structural units, and from 2004 on the orders of the Ministry of Education they become mandatory for higher education institutions of III and IV accreditation and to academic institutions. Now according to the Order of the Ministry of Education from 01.11.2005, in the structure of higher education institutions of III and IV levels of accreditation, under the Ministry of Education and Science, Youth and Sports, must act departments on intellectual property, or specialist or an expert in this field [29]. Higher education institutions of III and IV levels of accreditation are subordinate to other central executive authorities and higher education institutions of communal and private form of ownership is recommended to create such units or enter the above post. The necessity of such units is provided for scientific institutions.

Activity on the commercialization of intellectual property involves the invention of supply and reasonable options for the introduction of such intangible goods in the industrial sector or in the social sphere, as well as their production and service in economic commerce as an independent product. For the effective implementation of this work and getting real results, it is necessary to combine the efforts of specialists from different fields of knowledge, which in one educational institution (or scientific institution) is unlikely to find. The output is only in attracting extraneous specialists.

But while the leadership of the education institution required the invention of additional funds to pay for their labor, under present conditions, can not be considered as easy task. Furthermore, for the successful outcome activity of such specialists in the commercialization of scientific research activities and scientific and pedagogical staff their labor should be highly qualified, and therefore highly paid, that is quite difficult to imagine within the framework of the national education system. Especially that the department for commercialization of intellectual property is not within the meaning of mentioned order of independent business entity rights, but is a part of the higher education institution. At the same time, according to experts, giving to such department an independent legal entity rights would provide him the opportunity to become commercially attractive and competitive entity in the market of innovative services.

The above mentioned circumstances give reason to believe the idea of creating within higher education institutions units on the commercialization of intellectual property objects as ineffective measure.

Therefore, among the experts there was a proposal on feasibility to create a single center of innovative technologies, which will have legal personality. This will help, on the one hand, do not overload the higher education institutions in additional structures and duties. On the other – will be the institution which on professional basis will provide high quality services for public research and educational institutions.

5.3.6. Other innovative structures

The proposed changes to the Laws of Ukraine «On innovation activity» and «On Special Regime of Innovation Activity of Technological Parks» in conjunction with the introduction of changes to the Tax Code in the part of introduction of incentives for innovative projects performers will intensify innovative activities of enterprises. Thus the budget has nothing to lose, on the contrary – will increase revenues to the state budget and state target funds from created as a result implementation of innovative projects production.

In order to provide financial support of innovative activity for business entities by the Resolution of the Cabinet of Ministers of Ukraine of 12.12.2011 No.1396 [30] was established a state innovation nonbanking finance and credit organization «The Fund for Support of Small Innovative Business» and approved its Statute. The Fund should provide support on a competitive basis for introduction of domestic high-tech scientific, technical developments and inventions that meet the priorities of innovative activities and focused primarily on the implementation of innovative projects of small business entities (small innovative businesses).

According to the Resolution of the Cabinet of Ministers of Ukraine of 21.12.2011 No. 1394 in 2012 [12] was established the public joint stock company «National Joint Stock Company» Ukrsvitlolizynh», which aims at introducing modern LED lighting systems. With the participation of the company will be carried out, through leasing mechanism implementation of projects to replace obsolete equipment in LED lighting in different areas of production and life. In 2013, with the participation of the company can be implemented around 20 projects and involved in their implementation and start of new projects of about 70 million UAH.

Resolution of the Cabinet of Ministers of Ukraine of 01.08.2012 No.701 [11] was established Government Award for the development and implementation of innovative technologies, which is awarded for outstanding achievements in the development and implementation of innovative technologies in production and the market launch of domestic innovative products in the framework of innovative projects. Each year, five such Prizes will be awarded to the Science Day on a competitive basis. The award will be an additional incentive for Ukrainian scientists, innovators and businesses.

Consequently, the existing system of innovative infrastructure in Ukraine is functionally incomplete, not enough developed. It not only covers all aspects of the innovation process, but in an innovative environment virtually no structural formations such as venture funds and real functioning technology transfer centers.

5.4.Science parks: experience of the Visegrad Four

The experience of Eastern European countries (Czech Republic, Slovakia, Poland, Hungary) argues that universities are a key resource for creation of new enterprises based on high innovative technologies with higher requirements for knowledge and skills of their employees.

For example, knowledge-intensive indicators in the Czech Republic and some other countries show that universities are important structural units which influence the research.

For example, in the structure of scientific research implementation in 2010 in the Czech Republic almost 16% are universities, 66% – private sector, 17% – provides by the state. In the field of scientific research in the country employing more than 26.3 thousand people, and amount of financing – to $ 3.49 billion USA, with the lion's share belongs to private capital – 56.9%, state finances are only 39.0% [39].

CZECH REPUBLIC

During the last years the Czech Republic increasingly focuses on the development of science, but only at the expense of the state budget, science can not fully develop, so funding for research exercised through the introduction of grants. The Czech government, universities and the Academy of Sciences of the Czech Republic set up funds that finance basic research. Some research funded agencies that created by ministries and agencies, large industrial companies interested in scientific research. An important role in the distribution of funds plays Agency for Technology (founded in 2009), which supports programs applied social research projects, experimental development, innovative research and so on.

As a result of reforms in the system of Czech science was minimized government interference in scientific work, simplified mechanism of research funding from the state budget, stimulated competition in the field of science and technology, supported by the integration of research activities in universities, strengthened links between universities and Academy of Sciences of the Czech Republic, provided support to international scientific innovative cooperation. Universities and the Academy of Sciences of the Czech Republic were able to determine priority areas of research.

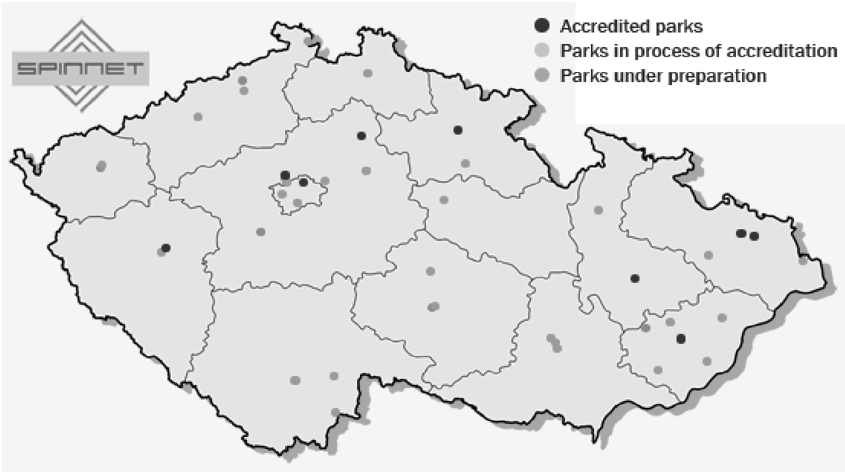
In the Czech Republic communications between science and industry became very important, introduction of scientific developments into production. In the initial period of reforms was envisaged that the industrial research institutions are transformed into regional technology parks. Research organizations founded the Association of science parks, which was a base for the reorganization of research institutions. For the introduction of technology into production was established the Association of technology transfer and exchange. In political circles, this position was not supported, resulting in 105 research institutions have been privatized and its activities have become less engaged in scientific research. Have been implemented government programs "Park" and "Transfer", which provided real support to small and medium enterprises. Also, local budgets play an important role in financing of research projects.

The academic sector reoriented to engineering science and applied research. This created an opportunity to establish closer contacts with the management of scientific and technological parks. Scientific and technological parks emerged and in the Academy of Sciences, although they were less productive than established on the basis of industrial enterprises.

Gradually formed links between universities and industrial firms. They acquired the character of research expertise of new technologies and scientific developments that were used in production.

The Czech Technology Park is a low density development providing modern business premises for technology companies in a business park environment adjacent to the Brno University of Technology. The park is intended to provide a total of **190,000 m^2** of mixed commercial accommodation for office, research and light industry, together with associated retail, leisure and services facilities.

Figure 5.1



Dislocation of technology parks in the Czech Republic

With over **52,000 m2** of grade a office and high-tech production space developed to date accommodating 20 resident companies employing in excess of **4,500 employees.**

The Park is already acknowledged as the predominant project of its type in the region.Thanks to its location alongside the Brno University of Technology the project offers specific advantages to locating companies providing a technically skilled graduate workforce and research and development opportunities with this leading institution.

The Czech technology park is being developed by **Technology Park Brno, a.s. (TPB)** acting as a real estate investor-developer. The company provides a complete turn-key service to locating companies for their real estate requirements whether by way of new build or within existing available Park premises. An experienced management team with a proven track record is able to address the most complex accomodation requirements and is used to managing high specification installations such as clean rooms and business process technology networks.

The Park has a list of successful **project references** to date as set out below. Other requirements are of a more straightforward nature and can be accommodated in standard office space where the Park's offer of flexible accommodation in a range of office suites from 100m2 to large open plan floorplates of 2,150m2 provides a suitable solution for all project requirements allowing future expansion options. Incoming tenant fit-out requirements can be managed by the Park's in-house team and a design service is on offer to assist in the space planning exercise.

The scheme's success is demonstrated by the renowned list of clients already based in the Park with IBM, FEI, Motorola, Vodafone and Silicon Graphics among the main occupiers.

The Park's masterplan is divided into a series of zoned areas which should be developed in several Phases with a**total construction volume of 190 000 m2**.

These zones provide the outline planning use with office, high-tech production, services & retail and residential areas catered for across the park area.

The developmentzones are of low density and provide a high proportion of green landscaped areas with the entire park surrounded by natural woodland and protected areas creating an overall pleasant campus environment.

Pilsen Science and Technology Park

The Pilsen Science and Technology Park is located in the southwest section of Pilsen, at the Pilsen-Borská pole Urban Industrial Park. Work on the project was launched in 2004. Later, in 2008, the park was opened to companies with innovative activities.

The Pilsen Science and Technology Park offers rental space including corresponding equipment and professional consulting, stimulates and manages the transfer of knowledge and technology between university or research institutions, innovation companies and the market, and provides space for creative, dynamic people to develop their potential.

The Pilsen Science and Technology Park – Phase I project was co-financed from the Operational Programme Industry and Enterprise 2004 – 2006, Prosperita.

The Pilsen Science and Technology Park – Phase Ii project will be implemented by the City of Pilsen from 2009 till 2012. Co-financing from the Operational Programme Industry and Enterprise 2007 – 2013 Prosperita is expected for the project to be implemented successfully.

The main activity of the project is to develop the existing infrastructure for industrial research, technical development and innovation in Pilsen.

The main targets of the project include:

- Support for the business environment
- Support for incorporating new businesses and developing small and mid-sized businesses, particularly those focused on research and development
- Motivation and job opportunities for secondary school and university graduates
- Links between commercial R&D and the university and research institutions
- Support and assistance for projects implemented within Europe and worldwide.

Science and Technology Parks Association of the Czech Republic

The Science and Technology Parks Association of the Czech Republic (**STPA CR**) belongs to the founding organisations of the Association of Innovation Entrepreneurship of the Czech Republic (AIE CR). The Association started its activities on July 27, 1990 and since that time it actively takes part in establishment preparatory work and assists in the activities of a number of Czech science and technology parks (STP CR).

STPA CR is a union of natural persons and legal entities that support an efficient course of the innovation process from the outcome of science and research as far as to the practice, participate in successful establishment of small and medium sized innovation firms, transfer of technology, hi-tech, and among others provide supporting services utilising infrastructure available.

An important base for establishing the science and technology parks is the scientific and technical potential of the research and development institutions. Their human resources, material and technical equipment, informatics, complex expertise in methodology and management, may represent very powerful initial assets for STP formation and build-up.

In majority of cases the parks emerge from the transformation process of former research an development institutes, sometimes they are products of private initiative of individuals or of creative groups such as research departments or project teams that spin off from a larger organizations (state owned enterprises or research institutes). They continue in their activities as independent non-profit or commercially aimed companies, sometimes provided with useful buildings, offices, production space, laboratories, instruments and equipment by the parent institutions.

The STPA CR is an institution oriented into fields of research, technology and innovation entrepreneurship. It utilises its know-how for establishing prerequisites for dynamic development of innovation companies, for transfer of technologies and education for innovation entrepreneurship. The STP is an internationally recognised way to the fastest overcome of technological backwardness and lack of market competitiveness and to creation of new perspective work opportunities in an active employment policy.

The STPA CR **is characterized by** two most important functions:

innovation – development of new products, not only consulting

incubation – help in start-up of small and medium sized innovation firms, in their marketestablishment and assistance in risk reduction. There are many different types of incubators registered in STPA CR directory.

Innovation companies are usually rather small or medium sized firms with the main intention to develop and marker new products (proprietary manufactured product, technology, service). Common feature of such activities is a high-risk level and usually high initial capital investment needed [46].

Principal aims of the STPA CR

- more flexible transfer of scientific and research results into the production practice and gradual overcome of technological falling behind
- achievement of better competitiveness both in domestic and foreign markets
- increase in efficiency of Czech research and development institutions regarding practical products
- strengthening of prospective, technically progressive production programs on account of outdated and inefficient processes, gradually solving in this way structural economy changes, especially in problematic regions
- revitalization of economy in certain regions by simultaneous creation of employment opportunities
- establishment of small and medium sized innovation companies
- education and training for innovation entrepreneurschip
- domestic and international cooperation of science and technology parks

Primary goals of the STPA CR

- registration of interest and initiative of various organizations and individuals to build up STP or innovation firm and providing them with fast orientation and special assistance
- securing support of central administration organs with appropriate powers for development of economy, especially of those responsible for utilization of practical results of scientific and technological research, development of individual industrial branches, development of regions, economy restructuring, for privatization and employment policy in regions characterized by substantial reduction of inefficient manufacture or agriculture

- linking and cooperation with financial institutions, saving and investment banks, capital and material investors, activation of domestic innovation markets and linking to networks established for technology transfer and know-how information, technology databases and marketing data sharing

- proposals for distinct legislative or systemic measures aimed at overcome of barriers for innovation firms and centers

- completion of privatization process also in creative fields

- enabling of fast startup for companies or groups of firms that do not have necessary space, equipment, and sufficient starting capital but do possess sound and prospective intellectual property

- reduction of risk issuing from still insufficient entrepreneurschip, commercial, financial and legal experience of beginners in innovation business

- securing consultancy, technical, educational and training services

- reduction of fixed costs for execution of necessary functions provided by parks for their clients

- dissemination of knowledge and positive experience in innovation enterprising using press, radio and television programs as well as specialized seminars and lectures. Mediation of consultations by experts and contacts with various institutions

- acquisition for STP membership among interested and influential personalities and institutions

- contacting and acquisition for cooperation in innovation entrepreneurschip with foreign partners and international institutions

- establishment of working national STP CR network and its linking with international organizations.

The Science and Technology Park of Palacky University in Olomouc (VTP UP) (Czech Republic)

The Science and Technology Park of Palacky University in Olomouc (VTP UP) provides office and facility leases, consulting services and the use of the equipment and know-how of Palacky University with favourable terms. Through the Business Incubator Science and Technology Park help start-up entrepreneurs in starting a business with a unique idea and plan. VTP UP is focused on providing financial, patent and grant advice. VTP UP has been a bridge between the scientific and business world since 2000.

VTP UP is a self-sustaining economic unit of Palacky University in Olomouc. It directly benefits from the facilities and know-how of the University and passes these benefits onto its clients.

Thanks to its focus, VTP UP is an important regional partner for the Regional Office of the Olomouc region, and the city of Olomouc.

Science and Technology Park at Palacky University in Olomouc (VTP UP) contributes to growth of economic level in the Olomouc region by supporting the development of innovative companies, creating spin-off and start-up companies, with an emphasis on the use of Palacky University's (UP) potential. VTP UP locates and promotes cooperation within the application of science and research results in the commercial sector. It also transfers needs of the commercial sphere to scientific research institutes Palacky University in Olomouc.

VTP UPis finding use for science and research results in practice. Helping to change good ideas into great companies.

Vision

VTP UP is a technological address in the Olomouc region with competent consulting center for mutual support and sharing of advanced technologies among innovative companies and scientific-research workplaces of UP. It provides protection and commercial use of intellectual property of Palacky University in Olomouc, companies in VTP UP and companies with joint venture UP. Business Incubator helps newly created innovative firms with smooth start and entry into the real business environment. It also supports the growth and development of existing innovative companies. Due to the quality of outputs is VTP UP respected institution on the international scale.

History of the Science and Technology Park of Palacky University in Olomouc

Science and Technology park of Palacky University in Olomouc was established in 2000 under the name Center for innovation and transfer of technologies UP. Its first premises were reconstructed by Palacky University in Olomouc, with the financial assistance of the Government of the Czech Republic through grant support from the Ministry of Industry and Trade, Ministry of Regional Development and funding of a pilot project Phare.

Construction of the second building B – Business Incubator was financed by Phare in the years 2004-2006 with the financial participation of the city and Palacky University Olomouc. Furnishing the space and operation of the Business Incubator was funded by the Operational Program Industry and Innovation, and co-funded by the Regional Office of the Olomouc Region and the Palacky University in Olomouc.

Reconstruction of the original building block A was carried out between 2010 and 2012 with the support of the Operational Program of Enterprise and Innovation.

In 2012, construction of the third building block C VTP UP began, with the support of the Operational Program of Enterprise and Innovation. The operation was launched in 2015.

Services provided to innovation companies:

- Management of intellectual property of Palacky University in Olomouc;
- Business Development, Proof-of-Concept projects, commercial cooperation with firms (contract research, custom research, licensing agreements), establishment of companies;
- UP Business Club – education and community– VTP UPcreate inspiring, creative and friendly community of students, businessman and entrepreneurs from the Olomouc region;
- UP Business Consulting – VTP UPconsult business plans and assist in the start-up phase of your business;

- UP Business Center – VTP UPrent spaces for start-up and innovative companies (offices, laboratories, pilot plant spaces, co-working and virtual headquarters) in our three buildings;
- UP Business Catapult – convenient program for the most interesting projects, renting and consulting services of our consultants and mentors at discounted prices or for free (Business incubator);
- Project support for academics and companies;
- Educational and networking events for personal and business development;
- Consults business plans and assists in the startup business;
- Give feedback on business plans and help getting the ready;
- offer space for business:
  - rental of offices and laboratories;
  - virtual office;
  - co-working;
  - offices;
  - manufacturing facilities;
  - laboratories;
  - training room with refreshments ALL inclusive.

SLOVAK REPUBLIC

The state R&D sector consists of research institutes of the Slovak Academy of Sciences (SAS) and state sector R&D organisations established by central state administration bodies.

The SAS is a self-governing scientific organisation of the Slovak Republic established by special Act, the activity of which is aimed at the development of science, education, culture and the economy. The SAS conducts its research activity by means of research institutes established on the basis of either full or partial public funding. State sector R&D organisations funded in full or in part by the state are established by the appropriate central administrative bodies [43].

Political support of cooperation between universities with business in Slovakia is mainly reflected in the declarative strategic documents. One of these documents is a **«Long-term plan of educational, research, and other creative activities at universities by 2014».** The first priority of the cooperation of universities with business, named in this document, improve the quality of science and education at Slovak universities and noted that modern enterprises will cooperate only with those academic institutions that provide it. Support from the government of this area is based solely on the recommendations and implemented mainly through projects, funded by the European Union.

Research Center of the University of Žilina.

The University of Žilina is one of the most significant educational institutions in the Central European region, divided into 7 faculties, 53 departments. It has a long tradition going back to 1953, with focus on technical studies. Tradition and long years' experience are meeting here with modern infrastructure and equipment to provide appropriate conditions for the activities planned within this project.

Research Center of the University of Zilina was established in 2013. Its mission is to act as a regional center for applied research, integrating critical research activities. The role of the Research Centre, University of Žilina is not only the realization of excellent research in industrial practice, but mainly carrying out research with a direct impact on the daily life of man.

Main research areas

Main research areas are basically focused on the University of Žilina. In each of these areas, the university is considered to excel on European level and is taken into account worldwide. The areas are transportation including control, operation and new materials, construction, mechanical engineering and smart systems, mainly focused on smart buildings operation and renewable energy sources.

Research centre is focused specifically on three areas:

According to these areas, the Research Centre is structured into 3 divisions with following laboratories, machines and equipment:

- Design and operation of smart buildings and renewable energy sources
- Monitoring and evaluation the transport infrastructure conditions
- Progressive materials for transport infrastructure and vehicles production.

Science Park of the Technical University in Kosice.

Education, research and development at the Technical University of Kosice (TUKE) in 2010 were significantly supported from the structural funds that brought funding from EU. Currently, there are 36 projects running at the University with total budget of 59,7 mil.EUR. The sum of the nonrepayable subsidies exceeds EUR 56 m. The share of TUKE in the funding finances is 5%, which means our University provided EUR 3.1 m.

In 2012, upon completion of a project bearing the same name, a new body was established at the Technical University of Košice – **University Centre for Innovation, Technology Transfer and Intellectual Property Protection (UCITT)**. The tasks and the services that the centre provides include cooperation with industries in the field of applied research, innovations and technology transfer (ITT) from academy to industries, support for research, scientific and innovation projects, support for intellectual property protection (IPP) of results of the scientific activities conducted at TUKE, support for human resources development and methodology of services for the abovementioned fields, promoting achievements in ITT using a portal information system. The mission of the **UCITT** centre is to create a relevant virtual environment at the university that will permanently support R&D in terms of cooperation between scientists and practice, and to ensure efficient transfer of knowledge, products and technologies into society and economy. Using its network of Slovak and international connections and open architecture of its information platform, **UCITT** facilitates effective proliferation of its services in national, regional and international research, social and economic area. Currently, the most intensive activity is the preparation of patent activity in the field of IPP supported by updated internal legislation within TUKE.

Mission

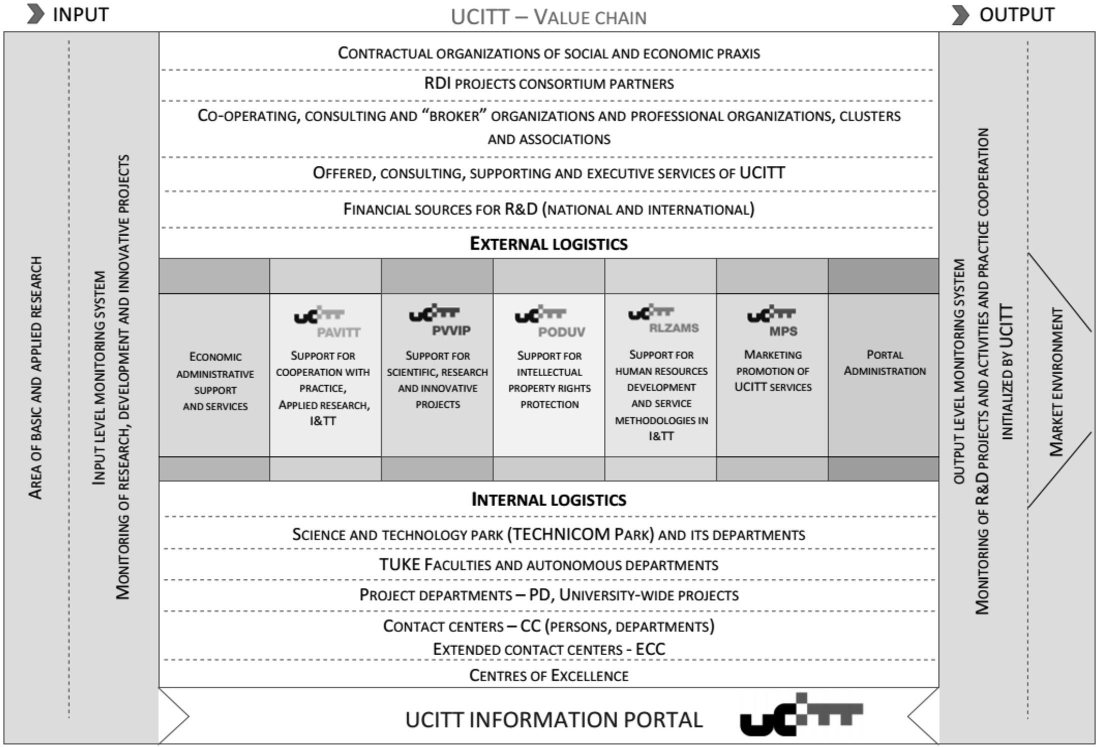
The mission of UCITT is undertaken in line with the proposed **"value chain"** conceptual model.

The model specifies UCITT's external and internal relations interconnected by its services; which, in the horizontal direction, ensure the value added flow from research, development and innovation base towards effective outputs in its scope of influence in the social and commercial practice.

In the context of the value chain, the concept of the UCITT mission focuses above all on the following activities:

- Supporting the efficiency of research, development and innovation (RD&I) conducted at the University by its direct and active connection with the needs and requirements of the industrial practice, small and medium enterprises and the social sector,
- Contributing to the identification and valorisation RD&I projects and project outputs that have the potential for further active cooperation or can be utilized in the social and economic practice,
- Supporting the identified RD&I outputs and projects and their extension by means of:
  - joint (cooperative) RD&I projects,
  - innovation projects for practice,
  - knowledge transfer, or transfer of technologies to respective organizations in the social and economic sectors,
- Providing complete intellectual property protection services to University staff and students,

Table 5.2



UCITT value chain

- Supporting development and effectiveness of national and especially international cooperation in the field of RD&I projects, including projects in which organizations from social and economic practice are involved.
- By means of its network-based organization structure, UCITT will facilitate cooperation between RD&I Faculty-level units and/or autonomous departments and the coordination unit on the University management level and thus create an integrated and flexible organization and management structure of UCITT within the University.
- Establishing the integrated network architecture of UCITT as an open platform that enables UCITT to provide services to cooperating external/contracted national and international organizations and organizations evincing interest in cooperation. These include especially organizations in the areas of:
  - academic and scientific institutions,
  - social and business practice,
  - consulting, innovation intermediation and technology transfer.
- Supporting and contributing to initiatives and processes related to creating science and technology park and business incubator for innovative companies and facilitating sustainable cooperation with these institutions.

The mission of UCITT in the field of its activity is to create a virtual environment facilitating continued support for the development of mutually beneficial RD&I cooperation between research and practice. Its aim is to contribute to the effective transfer of knowledge, products and technologies into the social and commercial sector. Using its relations and support from the open architecture of its own information platform, UCITT ensures pertinent and efficient proliferation of its services and suitable products in the national and international research, social and business environment. These features of UCITT mission will also contribute to the European innovation policy.

Structure

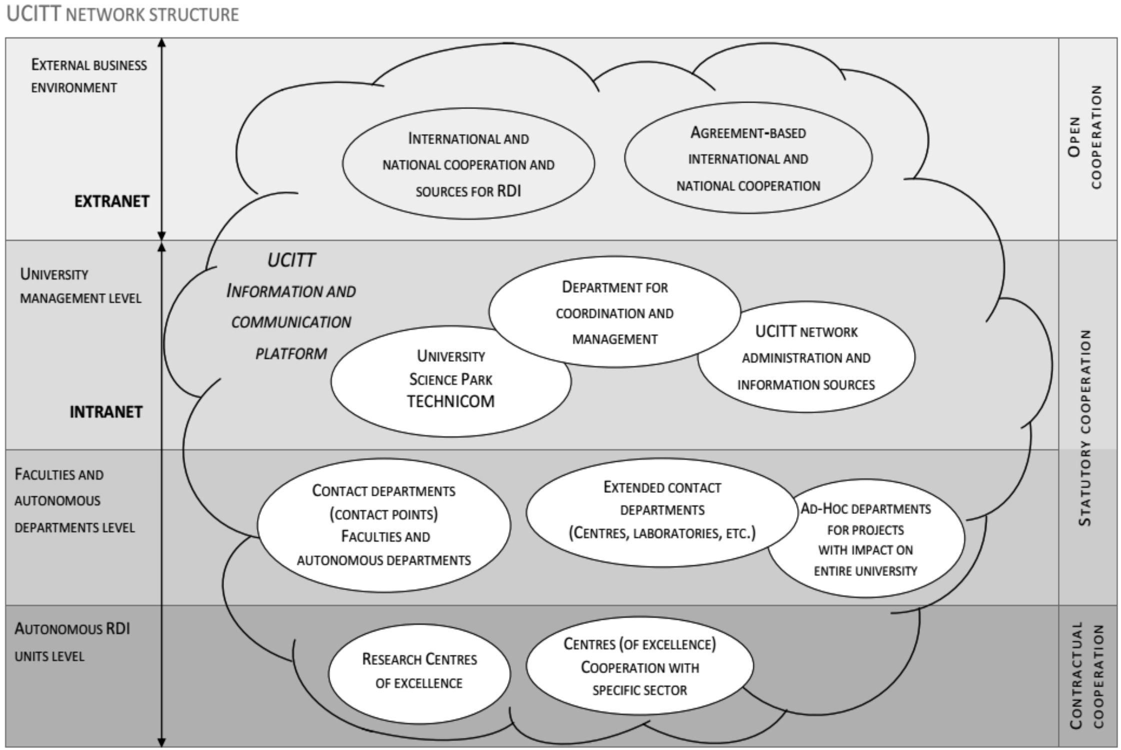
UCITT is based on an open and flexible conceptual framework of organization and management structure, which minimizes risk factors and creates conditions for the following:

- forming a flexible and open organization and management structure of UCITT,
- purposeful and specialist-oriented distribution of competencies in UCITT service provision,
- direct contacts and connections between operational research units / research workers and industries,
- purposeful content and competence oriented departments aiming at achieving high professionalism, commitment and motivation among workers,
- flexibility and accessibility of services supporting commercialization of R&D outcomes and adequate intellectual property protection for all stakeholders.

The personnel and network organization structure of UCITT is based on the following principles:

- autonomy of functional UCITT organization units (departments) is guaranteed by internal contractual relationships,
- all units are adequately represented in UCITT scientific, executive and controlling institutes,
- active participation in the development, financing and management guaranteed in consensually accepted UCITT organization rules,
- protection of intellectual property and copyright,
- compliance with TUKE Statute and relevant regulations,
- protection and development of tangible and intangible property and shared infrastructure.

Table 5.3



Network structure of UCITT

POLAND

Improving the effective application of knowledge and scientific research outputs is an important challenge for Polish enterprises. Institutions supporting innovative business by working at the intersection of science and business are one of the key factors determining success of the economy. They act as a bridge, facilitating communication between the worlds of business and science.

Furthermore, the periodic benchmarking of technology parks in Poland is intended to support their management and employees, as well as the owners of the entities supervising their work in the modern governance and the strategic planning processes. Thanks to the systematized comparison of technology parks from all over the country, benchmarking helps to develop business solutions utilizing the best practices of Polish technology parks. ***Their location within Poland is presented on the map below.***

Figure 5.4

Dislocation of innovative institutions in Poland

Polish accession to the EU and the opening of foreign markets has changed the conditions under which companies previously operated. It resulted in an abundance of private enterprises and an influx of foreign investments. It also gave innovative businesses the tools needed for development.

Thanks to systemic changes and the many bottom-up initiatives, the number of innovation centers and enterprises has been growing steadily from only 195 in 1995 to 735 by mid-2010. Many of them are entrepreneurship centers: training and advisory centers, business centers, consulting centers and entrepreneurship incubators.

Simultaneously, specialized institutions for innovative business support have been filling the Polish market. Supportive, quasi-banking financial institutions like seed capital funds, business angel networks, regional and local loan funds are becoming increasingly common. Institutions enabling the introduction of novel products and services, like technology parks, technology incubators, pre-incubators, academic entrepreneurship incubators and technology transfer centers, have been undergoing intensive development.

In these crucial spaces, innovative R&D meets with the potential and expectations of business organizations and funders. It is here where small and nascent enterprises, hungry for success, get a chance to succeed and where everyone interested in innovative entrepreneurship can cooperate and flourish. All these possibilities are presented in subsequent chapters, which describe the main innovation centers in Poland: technology parks, technology incubators and technology transfer centers – 60 companies and institutions in all.

Industrial and technology parks are places which, due to a concentrations of firms from one sector and supporting science and research facilities, are enabled to develop quickly. This is a pro-development model that is increasingly being implemented in our country. The facilities being offered, are applicable both to Polish and foreign businesses.

Though there are many common factors in the industrial and technology parks (missions, goals, forms of operating, organisation, etc...), it's a very diversified segment. Each of the parks has its own individual character, stemming from regional social, cultural and economic factors, together with the facilities, materials and human resources available. There is no universal model for the parks, or organisational form for businesses, guaranteeing success. Specific initiatives reflect the differing local environments of: science and business, the economic character and industrial traditions, together with the cultural factors hindering business.

A technology park is a cluster of separate buildings together with a technical infrastructure, created with the aim of attracting an influx of knowledge and technology for scientific bodies and businesses. Entrepreneurs that use new technology are offered services in the form of:

- consultancy in the formation and development of an enterprise,
- transfer of technology,
- transfer of results from scientific research and development work, into technological innovation,
- creating favourable conditions for businesses.

The Poznań Science & Technology Park is recognised as the first Polish technology park – it was established in May 1995. The Polish Business and Innovation Centres Association, oversees the development of Poland's technology parks, its headquarters are in Poznań.

A industrial and technology park is by contrast a cluster of separate buildings together with an infrastructure remaining after restructuring, the bankruptcy of an enterprise or of other buildings added to it. These types of parks are formed with the assistance of local authorities and are aimed at providing preferential conditions for businesses, in particular for small and medium sized firms. The goals for industrial and technology parks are, primarily:

- providing offers of workspace for commercially viable companies that use new technology,

- attracting investors,
- creating jobs.

Poznań Technology and Industry Park

The Poznan Science and Technology Park is the first science and technology park in Poland. It is the place where science and business meet, ideal for those who are searching for innovative solutions. The Park's offerings are targeted at businesses, research and development entities, university research employees, as well as representatives of local governments and business support organizations.

Evolution of the idea and mission through:

- Initiating and activating cooperative connections across the Wielkopolska Region.
- Intensifying city and region competitiveness by offering conditions that will attract prospective investors.
- Strengthening of the local economy by activating post-industrial areas.
- Arranging, developing, and supporting platforms and other tools designed for establishing entrepreneurial relations.

PTIP Goals:

- Assistance with establishing, expanding, and promoting business entities including small and medium businesses using state-of-the-art-technologies.
- Initiating and activating cooperative connections across the Wielkopolska Region.
- Intensifying city and region competitiveness by offering conditions that will attract prospective investors.
- Strengthening of the local economy by activating post-industrial areas.
- Arranging, developing, and supporting platforms and other tools designed for establishing entrepreneurial relations.
- Creating new jobs also in the sector of advanced technologies.
- Fostering transfer of technologies – building cooperative relations between the Park investors and the R&D sector.

- Arranging, developing, and supporting platforms and other tools designed for establishing entrepreneurial relations.

The Park is active in several areas: providing office and laboratory infrastructure for tenants from R&D organizations; research and development – in cooperation with the Adam Mickiewicz University in Poznan and along with interested scientists, it creates Research Centersresponsible for knowledge commercialization. Atthemoment, they include Research Centers in the field of chemical technologies, waste management, archeology, medical diagnostics, speechtechnologies,social and cultural activities as well asspatial analyses and social and economic analyses.

Technology area:

- designed for businesses in mature stage of growth, forming their strategies and competitive advantage based on innovative behavioure;
- designed for the most prospective businesses of the Wielkopolska Region.

In the area of incubation, PPNT FUAM promotes academic entrepreneurship in Poznan and supports the establishment of innovative companies, from initial conception to company establishment and development, as part of the Technology InQbator.

Business incubator:

- The incubator will offer favourable conditions of growth for newly established businesses by providing: very attractive floor surface rental prices; furnishing of necessary infrastructure, internet and front office access; training, consulting, assistance with finding business partners;
- Two floors will host the incubator (approximately 850 square metres of office surface each).

PPNT is also active in the areas of consulting and training, supporting innovative processes in businesses, commercialization of scientific knowledge and development of support instruments implemented by the government.

Business and commercial area:

- two conference and training rooms fully furnished with up-to-date multimedia equipment. The room rental service is offered both to Park-located and external entities;
- office surface for businesses providing services to Park entities;
- server space rental, servers located at levels 0, +1 and +2 of the new building. Renting server space to Park-located businesses.

Infrastructure:

– Access to basic office equipment (e.g. photo copier, printer, scanner, etc.);
– Access to state-of-the-art infrastructure (broadband Internet, telephone network);
– Arranging and acting as a go-between in contacts with universities and scientific institutions;
– Services of general tax and legal counselling.

The Park features the Technology Transfer Department whose main function is the provision of integrated services supporting business activities and innovations. PPNT is open to co-operation with people and institutions interested in establishing Research Centers, innovative enterprises, as well as specialists who will contribute to the knowledge commercialization offerings.

Jagiellonian Centre of Innovation Ltd. (JCI)

The Jagiellonian Centre of Innovation Ltd. (JCI) wasfounded by the Jagiellonian University in Krakow to provide support for the development of life sciences in the region of Lesser Poland. The JCI provides the laboratory infrastructure of the LifeScience Park, encourages large and medium businesses to make use of the region's research potential, stimulates the development of small and medium enterprises in the life science sector through, for example, capital investments, and creates conditions for the commercialization of scientific findings in this field.

To fulfill these goals, the JCI has created special organizations that comprise the "JCI Group", which manages the specialized LifeScience Park in Krakow. The Park is made up of three interconnected buildings, two of which are dedicated to large and medium enterprises, while the third, the BioIncubator, has been designated for start-up firms and scientific projects with a high commercial potential. In the laboratory area the Park's infrastructure may be freely adapted to conduct advanced research in the fields of biotechnology, medicine, pharmacy, biology, chemistry, physics, nanotechnology and environmental protection. The laboratory space has been integrated with a shared area that acts as an organizational back office for all research activities conducted by the Park's clients: meeting rooms, conference and video conference rooms as well as technical and social facilities.

In addition to the Park, the JCI Group also invests capital in innovative projects and enterprises from its sector. The goal is to seek out, identify and support innovative ideas and on their basis create new firms that will implement innovative technologies and ideas.

Lublin Science and Technology Park

The Lublin Science and Technology Park aims at developing the economic potential and integrating the academic environment of the Lublin region. The Park helps to commercialize research results. It actively supports companies that implement state-of-the-art technologies and solutions and performs a range of projects co-financed with EU funds, targeted at both students and scientists as well as entrepreneurs interested in investing in science.

The Park has a base of over 400 scientists who can use specific research for particular industry branches, take various measures in commercial undertakings, prepare expert opinions, and present opinions in the area of science related to a particular enterprise.

The long-term goal of the Park is integration with an innovation network at home and abroad and the creation of a place for technology transfer for all parties to this process: academic centers, entrepreneurs, large and small companies, technology transfer centers, public agencies, foundations and investment funds.

The Park's offerings are targetedatscientific andresearchentities,technology centers,business environment institutions, students and graduates of Lublin universities, training and consulting companies, companies with a high innovation potential and enterprises and institutions which are potential lessees of conference, exhibition and training area.

It covers training and consulting centers, including study visits to innovative companies at home and abroad, comprehensive organization of conferences, congresses (business, academic and medical), help in obtaining opinions of scientific and research entities about the innovativeness of a given project, as well as linking academics to entrepreneurs.

The Science and Technology Park "Technopark Gliwice" Ltd.

Located in the center of the campus of the Silesian University of Technology in Gliwice, "Technopark Gliwice" was brought to life by the city of Gliwice, the Silesian University of Technology and the Katowice Special Economic Zone S.A. Main areas of the Park's activities are: promoting entrepreneurship based on innovation, technology transfer, incubating new technology enterprises,supporting the process of creation and development of innovative companies mainly through financial and legal consulting, training devoted to entrepreneurship in the area of innovative technologies, help in developing business plans and acquiring grants from EU funds, as well as scientific and research services. Technopark is interested in entering into close cooperation with large economic organizations that could be potential future investors in the Park's further development. For that reason, it offers shares in the company to large enterprises who would like to place their branches here. Thanks to the convenient location, such enterprises will have direct access to laboratories, as well as contact with scientists from the Silesian University of Technology, and perhaps most importantly, its graduates. “Technopark Gliwice” currently houses 28 technology companies, mainly from the IT industry.

The Science and Technology Park “Technopark Gliwice” Ltd. supports:

- Creation of new, innovative technological companies;
- Transfer of technology to small and medium-sized companies;
- Gaining grants from the European Union;
- Implementation of research projects;
- Measuring and monitoring services;
- Promotion of small and medium-sized companies;

The most important aim of “Technopark Gliwice” Ltd. is creation of modern investment venture which is consistent with the European Union, satisfies investors’ expectations and which allows young, technically educated people to an economically effective and socially profitable running a business activity and taking advantage of enormous intellectual capability, which is embedded in the Silesian society.

“Technopark Gliwice” has received many distinctions, including “Innovative Company of 2008”, “Innovative Project 2009” and “Business Partner 2010”. It has concluded agreements with 30 scientific institutions (departments and institutes), four universities, four parks in Poland as well as foreign institutions under an international project consortium. In the near future, it plans to build a new technology incubator.

Łódź Regional Science and Technology Park – Technopark Łódź

By stimulating cooperation between science and business, Technopark Łódź creates conditions for enhancing the competitive edge of local companies. It is currently implementing the BioNanoPark, which includes modern bio- and nanotechnology laboratories providing research services mainly for small and medium enterprises. Research will be less expensive thanks to public aid. The laboratories plan to develop their own technologies and transfer them to interested businesses. The first laboratory, specializing in medical implants, is already in operation. The BioNanoPark will also include modern office and conference space. Office and laboratory sections will be created that are dedicated for use by small companies and equipped with laboratory equipment and media necessary for conducting their research. Technopark Łódź also includes investment parcels for companies who want to establish their own offices on its grounds. It offers long-term lease parcels with contractual right of first refusal. It is looking for investors and entrepreneurs mainly from the biotechnology, pharmaceutical, cosmetic, medical and food industry who could use the laboratories' services. A Technology Incubator is already operating at the Technopark, providing excellent conditionsfor young entrepreneurs and offering them office space equipped with furniture and computers, free advertising as well as business consulting.

Polish parks represent a very good alternative for foreign investors. They provide an advanced infrastructure, links with dynamic businesses and research institutions in Poland and abroad, access to information, technology transfer, access to highly qualified workforce, help with administrative formalities and guidance during the funding process.

The next few years will bring an even more dynamic growth of science and technology parks. Thanks in part to the positive effects of achievements to-date, and combined with economic needs and financial conditions, several hundred million Euros will potentially become available to fund their development.

HUNGARY

Infopark Budapest

Infopark is the first innovation and technology park of Central and Eastern Europe. It is an innovation centre primarily for IT, telecommunication and software development companies where such multinational companies as Lufhansa Systems, Hungarian Telekom, IT-Services Hungary as well as young innovative companies found a place for their head office. The seat of the European Institute for Innovation and Technology (EIT) is found in the Infopark Building E. The office park has nearly 100,000 m^2 space to rent, offering high quality office and working environment for about 7,000 employees.

The Infopark's clinker brick buildings with unified design, arranged in a campus style layout, are situated in a high standard, landscaped environment with first class office spaces and up-to-date services.

At the time of commencing the development of Infopark IVG donated DEM 1 million to establish the InfoPark Foundation. The purpose of the Foundation is to support, with due consideration of the implementation objectives of Infopark, applied research and development (including its utilization) contributing to the development of society and economy in particular, and aimed to establish a network of connections between science and economy.

Office buildings developed by IVG can boast of several property awards: building C received the award of CIJ for **"The best office development in 2005"** and the award of Real Estate and Investment for **"The real estate project of the year 2005"**. The office building D received the award of CIJfor **"The best office building development in 2007"** and the **"Budapest architectural prize of 2007"**, in the year of hand-over [37].

5.5. Practice in organization of science parks in Ukraine

In recent years, with the support of the state conducted a large number of different events dedicated to the improvement of modern innovation policy. In particular, the problem of national innovative system formation involving parliamentarians and businessmen, government officials, National Academy of Sciences, universities and innovative structures was on June 17 2009 parliamentary hearings devoted to "The strategy of innovative development of Ukraine for 2010-2020 in terms of global challenges". Ministry of Education and Science of Ukraine held a number of measures to adapt the global experience in functioning of the various types of innovative structures to Ukrainian realities. Higher educational institutions of Ukraine joined to the creation on their base innovative structures of various types, including science parks.

Science Park «Kyiv Polytechnic» – is a legal entity that was created by the initiative of the National Technical University of Ukraine «Kyiv Polytechnic Institute» for purposes of organization, coordination and management of such process as commercialization of university research.

Science park was created to promote and support science, technology and innovation activities of the university, effective and efficient use of existing scientific potential of logistics for the commercialization of research and implementation in domestic and foreign markets.

The Law of Ukraine «On the Science Park»Kyiv polytechnic», which was adopted in December 2006, opened the way for companies interested in cooperation with scientists, faculties and departments, obtaining know-how and attracting high-quality human capital. This law created favorable rules for media innovation. Moreover, we do not require any exemptions from the state - our strength lies in the interaction, the synergy of interaction between participants. For dry according to the law created an environment where travelers feel scientists, inventors, and at the same time, businessmen who want to associate your business with high-Tecom. Science Park»Kyiv Polytechnic» organizes the interaction of four stakeholder groups: the first – the science of generating know-how, the second – the faculties and departments that generate high-quality human capital, the third – the companies that are on the market of high-tech products and is constantly in need of feeding know-how and human capital, and the fourth – investment and venture funds.

Science Park "Kyivska Polytechnika" is a form of scientific and research process organization which promotes effective commercialization of high-tech developments and was established on the basis of National Technical University of Ukraine "Kyiv Polytechnic Institute" (NTUU "KPI") in compliance with the Law of Ukraine "On Science Park "Kyivska Polytechnika" No. 523-V of December 22, 2006.

A transparent interaction scheme and developed infrastructure attract innovative companies and venture investors for the large-scale projects realization. Correspondent governmental support provides favorable legal background for the nationwide project development and, as a result, for innovative development of the Ukrainian economy.

Mission

Creation of competitive advantages for participants and partners of Science Park "Kyivska Polytechnika" by means of integration of education, science and business.

Aim

Commercialization of scientific research results and their implementation on domestic and foreign markets.

Tasks

- Designing and realization of innovative projects.
- Search of investors and partners.
- Management of innovative developments.
- Establishment and development of innovative companies.
- Promotion and marketing of science-intensive products on domestic and foreign markets.
- Networking with domestic and foreign scientific and industrial organizations.

Advantages of Participation

For high-tech companies

- development of technological solutions and creation of competitive products;

- innovative cycle reduction – time of the idea implementation into product;
- risk reduction of non-competitive products creation and manufacturing;
- attraction of competitive specialists for promotion of science-intensive products.

For venture and investment funds

- availability of implemented innovative projects which are ready for promotion on the market;
- availability of innovative projects with incomplete implementation stage;
- innovative developments “bank”;
- profitable fields of developments;
- guarantee of high-technological effectiveness and profitability of the invested developments;
- reduction of the invested funds pay-off period;
- potential of the large-scale end results implementation;
- interaction with the state on the governmental level.

And also:

- transparent interaction scheme between investor and project executers;
- control of investment funds target use;
- control of development and implementation process.

For scientists

- financial and technological conditions for realization and promotion of innovative idea on the market;
- royalty obtaining – remuneration for patented development use;
- popularity in scientific and business circles.

For faculties and departments

- preparation and graduation of highly qualified specialists with the experience of practical application of theoretical knowledge;
- development of scientific-laboratory base with the cutting-edge equipment;

- involvement of students and lecturers in innovative business.

For government on the national level:

- acceleration of Ukrainian economy innovative development ;
- ceasing of “brain drain”;
- increasing of the nation’s quality of life;
- increasing of foreign investments and export possibilities scale;

on the local level:

- appearance of new workplaces;
- increase of the nation’s income level;
- reinforcement of personnel component of the scientific-technical potential of the region;
- attraction of investments to the region;
- improvement of regional infrastructure.

Innovative projects of Science park «Kyivska Polytechnika»

Widespread usage of cleaner production technologies and environmental protection;

Technological modernization and development of agriculture;

Technology of energy transportation, introduction of energy saving technologies and alternative energy sources;

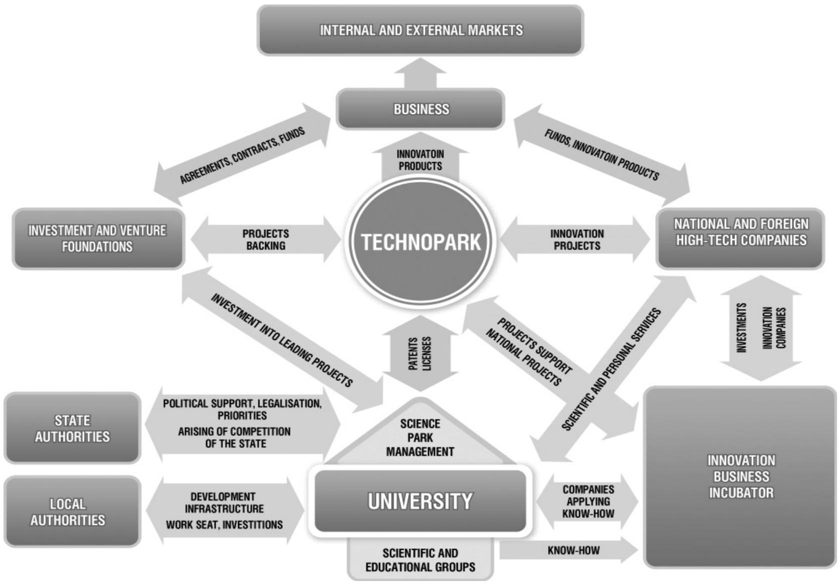
Technology of development of high-tech transport system, space industry, aircraft and shipbuilding, military equipment;

Development of modern information and communication technologies, robotics;

New technologies and equipment for quality health care, medical treatment, pharmaceuticals;

New technology of production of materials, their processing and connectivity, creation of nanomaterials and nanotechnology ind.

Figure 5.5



Interaction Scheme of the Science Park "Kyiv Polytechnic"

Business Incubator «Polyteco»

Youth IT Business Incubator «Polyteco» (hereinafter referred to as BI «Polyteco») – a project with the assistance of student entrepreneurial initiative, the basis of which is formed by progressive ideas in the sphere of IT.

BI «Polyteco» Mission

Education of the generation of initiative, professionally trained entrepreneurs, capable of getting involved into modern innovative sector of economy.

Urgency

For the youth of NTUU «KPI»

Desire to realize personal ideas and developments

High entrepreneurial activity

Lack of knowledge of practical (market) implementation of personal ideas

Interest in participation in the development of efficient strategies of market behaviour

For NTUU «KPI»:

The need of gained science-intensive ideas implementation in the sphere of IT

The necessity to train personnel, capable of technological breakthrough accomplishing

The prospect for NTUU «KPI» to become the centre of innovative activity and entrepreneurship

Strategic objectives

Creation of conditions for launching and commercialization of new and innovative ideas of students, postgraduates and young scientists of KPI in the sphere of IT

Education of students, postgraduates and young scientists how to manage projects in the sphere of IT

Establishing of the municipal youth innovation centre on the basis of BI «Polyteco».

Today in Ukraine created more than a dozen science parks, among which successfully work such as SP «AHROEKO» [7], SP «Podillja Innovation Development» and others.

5.6. Innovative projects of Uzhhorod National University

Uzhhorod National University carried out considerable work on the development of innovative infrastructure of the University and Transcarpathian region as a whole [2, 3]. To date UzhNU completed the process of creating the Science park "Uzhhorod National University" (hereinafter – SP "UzhNU") in accordance with:

- Law of Ukraine "On Scientific Parks";
- Decree of the Head of the Transcarpathian Regional State Administration of 04.11.2010 No. 747 "On small business support program of the region for 2011 – 2 012." [31];

– Decree of the Head of the Transcarpathian Regional Council No. 683 of 03.21.2013 “On the creation of the Science Park “Uzhhorod National University” [32].

Activities of the Science Park aims at implementation of innovations as one of the most important strategic elements of state policy of socio-economic development not only in Transcarpathia, but the country as a whole. Priority areas of the SP “UzhNU” formed under the Law of Ukraine “On priority directions of innovative activity in Ukraine” (433-15) in accordance with the directions of the UzhNU scientific activity and participants of the SP taking into account the priority needs of the region and country.

The purpose of the SP “UzhNU” creation is:

1. Stimulating of innovative activity in UzhNU and other universities and scientific research organizations, aimed at intensifying economic restructuring of the region.

2. Creation of favorable starting conditions for scientists, post graduate students, students and young professionals to create business structures (small and medium enterprises - SMEs) for activities in the field of high-tech industries and high technology.

3. Creating a favorable environment for existing and emerging SMEs interested in mutually beneficial cooperation with scientific and educational organizations to use their scientific and human potential.

4. Formation of innovative infrastructure, which provides:

– communication of the SP administration with state and regional government, financial, industrial and business structures, necessary to find sources of funding for innovative projects, producers and consumers of high-tech products;
– training and expertise (preliminary, technical and commercial) of innovative proposals and projects;
– support of innovative proposals, projects as well as technical and technological documentation on the stages of design, implementation and mass production;

- maintenance services necessary for the effective implementation of innovative projects, namely, accounting, auditing, market research, provision of legal services;
- creation of infrastructure consisting of buildings and constructions, communications and other systems for created and existing high-tech, knowledge-based SMEs – members of SP;
- promote international scientific and technical relations of high-tech SMEs in research and innovative activities;
- creation of new jobs in knowledge-intensive and high-tech industries of the region.

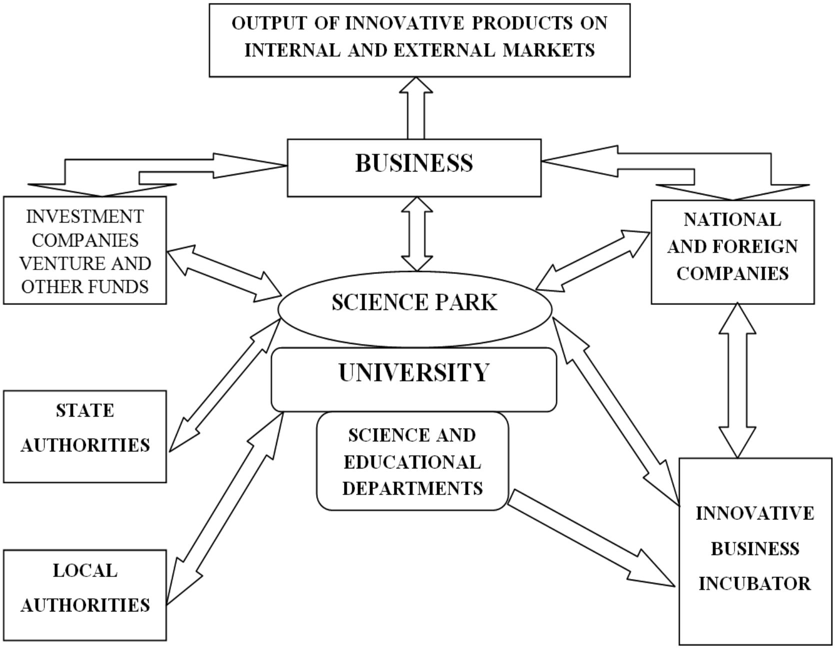
Priority directions of the Science Park innovative activities defined according to the laws of Ukraine "On Priority Directions of Science and Technology Development" (2623-14) and "On the priorities of innovation activity in Ukraine" (433-15) and directed for implementation of the Program "Regional development strategy of Transcarpathian region by 2015" and will be implemented in the following areas:

- implementation of energy efficient resource saving technologies, devel-opment of alternative energy sources;
- mechanical engineering and instrumentation as the basis of high-tech upgrade production;
- development of new technologies of materials, creating nanomaterials and nanotechnology industry;
- widespread use of cleaner production technologies and environmental protection;
- technological innovation and development of agriculture;
- new technologies and equipment for high-quality medical care, treat-ment, pharmaceuticals.

The structure of the Science Park "UzhNU" presented in Fig.5.6.

Uzhhorod National University is the founder of the Science Park and has coordinating functions in the interaction of SP with state and regional authorities, acts as the guarantor in the provision of physical infrastructure to the participants of Science Park, provides transmission within the current legislation existing scientific and technical developments and know-how to implement them within the SP, provides personnel training.

Figure 5.6



Structure of the Science Park «UzhNU»

Science Park Administration communicates with state and local governments, financial and investment institutions, businesses, providing production of scientific and technological product and its promotion on internal and external markets.

Innovation business incubator provides the implementation of new scientific and technical developments, commercialization, organization of small-scale production, the organization of new and support existing SMEs engaged in the commercialization of scientific and technological development of the University, conducting measures to protect intellectual property and its capitalization.

Innovative business incubator provides the implementation of new scientific and technical developments, their commercialization, organization of small-scale production, the organization of new and support of existing SMEs engaged in the commercialization of scientific and technological development of the University, conducting measures to protect intellectual property and its capitalization.

State authority carries political support for SP activities through creation of necessary legislative base and monitoring its implementation, identify priority areas of the country development, for which the SP may be involved, provides financial support through the placement of state orders for the development and implementation of scientific and technical products.

Local authorities use the SP activities as innovative infrastructure aimed at improving the socio-economic development of the rwgion, the use of local scientific, technical, personnel and material potential, provides financial support for innovative projects, whose implementation is paramount to improving living standards.

Developed an innovative program of the Science Park «UzhNU» [9] aimed at sustainable improvement of socio-economic balance of the region development by introducing new effective forms of innovative and investment cooperation of scientific and technical elite, business and financial circles, regional authorities and local communities using their own energy, naturally raw material, technological, logistical and personnel resources, and scientific and technical potential of the Science Park participants.

The issue of energy development and implementation of energy efficient, resource saving technologies and alternative energy sources will be resolved simultaneously on several directions. This assumes implementation of projects aimed at:

- effective implementation of energy saving technologies in the national economy, municipal and private sectors of Transcarpathian region;

- introduction of alternative energy sources;
- development of renewable energy sources;
- implementing environmentally effective recycling technologies of household and industrial waste;
- introduction of technology for insulating materials based on local raw materials and solid waste.

In the field of mechanical engineering and instrument-making provides work package, aimed at developing of competitive equipment and latest technologies in the following areas:

- ➢ association of engineering and design potential of scientists and enterprises of instrument-making and machine-build profile areas for development and introduction into mass production of high-tech products and advanced technologies;
- ➢ development of element base for instrument-making and machine-build (semiconductor gas sensors, chemical sensors, fiber optic biosensors, diffraction structures, etc.);
- ➢ a new generation of gas analysis devices for medicine and ensure safety measures in industry and everyday life.

Innovativeactivitiesinthefieldofhealthcareandtreatmentwill be implemented in the following areas:

- ➢ implementation of measures in the Transcarpathian region for early diagnosis, emergency treatment, rehabilitation and prevention of some common diseases (acute myocardial infarction, post ischemic stroke, epilepsy, HIV infection, etc.).
- ➢ effective prevention and correction of iodine deficiency, iodine endemic decline in the population of Transcarpathia;
- ➢ implementation of the concept of rational antibiotic therapy in the region by a quick (express) diagnostic of the disease agents, its sensitivity to antibiotics and therefore the need to use them (express-chips);
- ➢ development of technology and the introduction of new types of functional foods and beverages with different lo-

cal materials (and more) with bioactive components of plant and microbial origin, characterized by the ability to prevent (and regulate) diseases associated with disturbed metabolism – primarily food allergies, obesity and cardiovascular disorders.

Special attention is paid to the implementation of activities aimed at solving problems of the Carpathian region (environmental protection, technological innovation and development of agro-industrial complex), including the following areas:

- creation of systems for decision making under occurrence of man-made and natural disasters;
- study the level of pollution of air by carcinogenic substances in the cities of Transcarpathian region;
- study the impact of solid waste landfill on the ecological state of the environment;
- fight against the formation of mudflows;
- improve the environment of small rivers in Transcarpathia;
- preservation and reproduction of the upper forest line;
- fight against the spread of highly dangerous native plants;
- implementation (production and implementation) of developed in Uzhhorod biological products in farming of the region in order to ensure compliance of meat products by quality relevant to EU standards (without antibiotics, hormones - improved quality meat);
- biotech processing of agricultural raw materials for prolongation of storage without preservatives with improved organoleptic qualities (forage production);
- preservation of the gene pool of Hutsul breed horses;
- development of horticulture and viticulture.

The innovative program will identify and start realization of the most significant projects, that are of paramount importance for the improvement of social and economic development of the region, improve innovative activities in the industrial complex of the region. Has already begun work on implementing a number of projects included in Innovative program of the Science Park "UzhNU".

The project «Introduction of innovative energy saving heating elements of new generation (the «hotplate») in public sector organizations of Transcarpathian region», which is implemented under the Decree of the Head of Transcarpathian Regional State Administration of 04.11.10, No. 747 «On small business support program of the region for 2011– 2012.»[31] provides the transition to energy-efficient heating elements in budgetary institutions of the region (school and pre-school educational institutions, institutions of healthcare and social protection).

Under the Programme for Energy Efficiency and Energy Conservation of Transcarpathian region 2012-2015, Uzhhorod National University developed the energy saving program of UzhNU. It is proposed to introduce a system of solar vacuum collectors of trade-mark "Star Energy" (Odessa) on energy-consuming facilities of UzhNU, including university sports complex "Burevisnyk" to heat the pool water and space heating systems to support the sports complex, whose recoupment will be 3.5 – 4.0 years.

Projects of Science Park are integrated to the University educational process by reading special courses, perform course, diploma and master works, passing of production practice of students from physical, engineering and technical, chemical, biological and economic faculties of UzhNU.

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Educational publication

A series of «European Integration: Ukrainian Dimension»
Issue 27

INNOVATIONS IN HIGHER EDUCATION: DOMESTIC AND FOREIGN EXPERIENCE

Study manual

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Technical editor and Maker-up: *R. Kokina*
Cover design: *A. Brodych*
Translated by: *S. Zub, D. Miroshnikov, D. Bilak*

Signed to print 28.12.2015. Headset Cambria.
Conventional printed sheets: 20,2.
Format 60x84/16. Total circulation per issue 300.

Publishing house UzhNU «Goverla»
88000, Uzhhorod, 18, Kapitulna st. E-mail: hoverla@i.ua

Registration certificate
of the subject of publishing in the State Register of
publishers, manufacturers and distributors of publishing products
Series 3m No.32 of 31 May 2006

Printed by PE “A.A Demidov”
88000, Uzhhorod, Mytraka str., 25