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Knowledge economy in the European Union: Strategic decisions in the context of globalization

Economic and technological internationalization and development of new forms of economic, social and technological headway designed to create and further improve economies based on knowledge and high technologies sector in the European Union are analyzed here. The main emphasis is put on strategic decisions in the area of economic and technological internationalization, knowledge economy and high technologies sectors creation and further modernization as well as creation of scientific and technological progress oriented networks of clusters. High technology sectors development and clusterization oriented towards an increase of efficiency of various national and regional economies is a critical precondition for successful creation of the modern economy based on knowledge, both in the whole space of the European Union and particular countries. A concept of creation of regional and cross-regional clusters and their networks also known as „economic oases“ is suggested here. It is explained that in the economies based on knowledge development of clusters and their networks will soon become one of the core forms of economic and technological advancement. The idea of international clusterization generally oriented towards creation and promotion of high technologies is given. Some typical factors of the economic, technological and social development of the European Union are being described here, and it is subsequently proved that these factors reflect on the common context of creation of the knowledge based economies. Understanding these factors allows us to consequently implement strategies of two types that could create the economies based on knowledge: these are the strategies oriented towards integration of the processes of economic, technological and social development along with the strategies oriented towards the sythesis of the results of the economic endeavours and technology advancement of different origins. The promotion of the patterns based on the ideas of integration and synthesis is a core prerequisite for encouragement of innovations and improvement of technology transmission systems. Further research dedicated to the patterns mentioned above, is a promising trend of the science of economics as well as the science of management and administration directly connected to the needs for creation of knowledge based economies and internationalization processes in the European Union.

Gospodarka oparta na wiedzy w Unii Europejskiej. Strategiczne decyzje w kontekście globalizacji

Niniejszy artykuł prezentuje zjawisko internacjonalizacji ekonomicznej i technologicznej oraz rozwój nowych form ekonomicznego, społecznego i technologicznego postępu wpływającego na powstawanie i ewolucję gospodarek opartych na wiedzy i sektor najnowocześniejszych technologii. Autor szczególnie podkreśla strategiczne decyzje związane z następującymi dziedzinami: internacjonalizacja ekonomiczna i technologiczna, powstawanie gospodarki opartej na wiedzy

i sektorów najnowocześniejszych technologii oraz rozwój i tworzenie sieci klastrów nastawionych na rozwój technologiczny. Zmiany w sektorach najnowocześniejszych technologii i tworzenie klastrów w celu zwiększenia efektywności gospodarek na poziomie narodowym i regionalnym są niezbędne, aby stworzyć współczesną gospodarkę opartą na wiedzy, zarówno na obszarze całej Unii Europejskiej, jak również w poszczególnych krajach. Artykuł prezentuje również zjawisko tworzenia regionalnych oraz międzyregionalnych klastrów wraz z ich sieciami (zwanymi również „oazami ekonomicznymi”). Autor wyjaśnia, że w gospodarkach opartych na wiedzy rozwój klastrów i ich sieci wkrótce stanie się podstawową formą rozwoju ekonomicznego i technologicznego. Ponadto omawia pojęcie tworzenia międzynarodowych klastrów sprzyjających powstawaniu i upowszechnianiu najnowocześniejszych technologii. Prezentuje charakterystyczne czynniki rozwoju ekonomicznego, technologicznego i społecznego w Unii Europejskiej, a następnie udowadnia, że wpływają one na tworzenie gospodarek opartych na wiedzy. Zrozumienie wymienionych czynników pozwala na wprowadzenie dwóch rodzajów strategii mających na celu stworzenie gospodarek opartych na wiedzy. Mowa tu o strategiach nastawionych na integrację procesów rozwoju ekonomicznego, technologicznego i społecznego oraz strategiach związanych z syntezą wyników przedsięwzięć ekonomicznych i rozwoju różnorodnych technologii. Upowszechnianie wzorców opartych na integracji i syntezie stanowi kluczowy warunek rozwoju innowacji i systemów transferu technologii. Nowe badania poświęcone wspomnianym wzorcom stanowią obiecujący trend w dziedzinie ekonomii, zarządzania i administracji bezpośrednio związany z potrzebą tworzenia gospodarek opartych na wiedzy i wspierania procesów internacjonalizacji w Unii Europejskiej.

Keywords: internationalization, innovation, knowledge economy, high technologies, cluster, networking, European Union

Introduction

The prospects of social, economic and technological development in the European Union are getting more heavily dependent on the ability to initiate, disseminate and implement *innovations* in all spheres of life, especially in the new knowledge and high technologies oriented sectors. This factor is of particular importance for the development and expansion of the European Union because *activation of innovations* is considered to be a significant problem associated with social and economic development and the advance of science and technology knowledge based society and knowledge economy creation in the European Union.

Further activation of innovations is a major precondition for ensuring the competitiveness of the European economy under the conditions of globalization.

To activate the innovations in the European Union, *the potential of knowledge economy creation and of innovations should be purposefully developed and effectively used*. This is not only a major condition of successful development of *the economy in the European Union*, but also a major factor influencing the solution of the *significant global problems of economic development and technological advance*. The importance of the knowledge economy creation and innovation potential in the European Union for economic development and technological advance in the world is determined by the current role of the European Union and its influence on global changes.

The problems of purposeful development and effective use of the innovation potential in the European Union are considered now to be particularly *important* both from *theoretical* and *practical* perspectives. Therefore, these problems are in the focus of many research and practical works.

However, it should be noted that, so far, the discussion and solution of some particular problems have not been paid much attention to. Thus:

- a *dimension for describing the peculiar features of the innovation potential of the European Union* as a complex cultural, economic, technological as well as political and social system and space has not been suggested by researchers yet,
- in the process of innovation initiation, dissemination and implementation, various possibilities of achieving *synergetic effects*, also including the possibilities characteristic *only* of the European Union, have not been thoroughly considered,
- modern theories of innovation and innovation management do not offer a comprehensive analysis of the ways of creating and implementing innovations aimed at achieving *technological breakthroughs* and *qualitative changes* in the significant spheres of life of the community based on various *synergetic effects*,
- the lack of attention to the problem of *creating international network systems*, closely associated with activation of innovations, can be observed both in practical activities and modern theories,
- there is a lack of awareness that the international economy *is being transformed into a network – based economic system* and the influence of this transformation on *innovation activation* has not been adequately evaluated.

This paper addresses the above problems, presenting the ideas and the research results of the author aimed at developing the methods of their solution.

The major goal of the paper is to demonstrate new approaches to innovation activation and purposeful development of the innovation potential in the European Union, taking into account the trends of globalization observed and the challenges of the knowledge – based society being created.

The major tasks of the paper consist in:

- identifying the challenges of *innovation activation* under the conditions of the growing globalization and defining *a concept of innovation potential in the European Union*,
- demonstrating the main peculiar *features of the innovation potential in the European Union*,
- evaluating the possibilities of identifying and achieving *synergetic effects* under the conditions of the development of *international network systems* and showing the role of *international networks in activating innovations*,
- describing a *new type of transformations* taking place in the development of international economy, demonstrating the increasing *domination and significance of international network systems*.

A more detailed description of the problems associated with the innovation potential of the European Union and a new type of internationalization processes and transformations will be presented below.

1. Innovation potential and development processes in the European Union under the conditions of economic internationalization and globalization: the theoretical approach and main dimensions

The role of the European Union, its social and economic system and the influence on social, economic and technological development in the world is increasingly growing [Friedman, 2005; Altvater, Mahnkopf, 1996; Boldrin, Canova, 2001; Calori, Atamer, Nunes, 1999; Hofbauer, 2003; Melnikas, 2002; Melnikas, Reichelt, 2004; Redding, Venables, 2004]. However, the prospects of the development of the European Union largely depend on its *innovation potential*, therefore, the assessment of the *innovation potential* and possibilities and prospects of its further development is the basis for identifying and solving the significant social, economic and technological development problems [Cohendet, Stojak, 2005; Calori, Atamer, Nunes, 1999; David, Foray, 2002; Steinmueller, 2002, Melnikas, Jakubavicius, Strazdas, 2000].

The *innovation potential in the European Union* should be considered an *essential factor of global changes in the modern world*, implying that the ability to identify and successfully solve both *scientific and practical problems associated with the innovation potential development*, strengthening and effective use largely determine the prospects of the European Union and its role in the *global system*.

To purposefully develop and effectively use the innovation potential in the European Union, the following questions should be answered:

- how to define the *concept of innovation potential and the influence of innovation potential on social and economic development of the European Union?*
- what *challenges* should the innovation potential be *aimed* to accept under globalization conditions, in particular?
- what are the *major innovation potential elements* and how is it possible to *develop* this potential and *increase the effectiveness of its use?*

The above questions were discussed in a number of research papers from various perspectives. However, it should be noted that a *complex approach to the innovation potential as a system* has not been developed yet. The lack of a complex approach to this problem is one of the reasons why there is a lack of purposeful activities based on realistic strategic decisions, which should be aimed at *developing and effective use of modern innovation potential over the whole European Union*.

It can be stated that the description and information about a *complex approach to the innovation potential as a system* is a *necessary prerequisite* for activating various integration processes in all spheres of social, economic and technological development of the European Union. This also implies that *purposeful development and effective use of the innovation potential as a system* make an important area of research and practical work.

In general, *the concept of innovation potential in the European Union* can be defined as an *overall capacity of the European Union as a system to initiate, disseminate and implement various social, economic and technological innovations required for responding to new challenges and requirements under the conditions of globalization* [Melnikas, 2002; Melnikas, Reichelt, 2004].

The above definition may be considered *universal* since it emphasizes some *issues of a universal character*:

- a *response to new challenges and requirements* raised in the time of globalization is emphasized,
- innovation potential is perceived as an *overall capacity* to initiate, disseminate and implement innovations in various spheres of life,
- innovation potential is considered in the context of the *whole system of the European Union*.

It should be noted that the European Union may be defined in two ways (e.g. the European Union as an *organization uniting various states* and the European Union as a *multidimensional international system of social, cultural, informational, economic and other areas*). Therefore, *two attitudes to the innovation potential in the European Union* can be pointed out:

- *innovation potential of the European Union as an organization unifying various states*: in this case, innovation potential is approached as an *overall potential of all member-states of the European Union*,
- *innovation potential in the European Union as a multidimensional international system of social, cultural, informational, economic and other areas*: in this case, the innovation potential is approached as an *overall innovation potential of social, cultural, informational, economic and other areas*.

These two approaches allow us to reveal the capacities of creating, developing and updating the innovation potential as well as the alternative policies of innovation activation to be pursued in the European Union.

The innovation potential of the European Union should be perceived as a *very complicated system*. This view is based on two premises:

- the innovation potential of the European Union has *multi-sided orientation*,
- the innovation potential of the European Union has a *complicated structure*.

Multi-sided orientation of the innovation potential can be defined by showing the *diversity of the initiated, disseminated and implemented innovations and the*

needs for these innovations based on the above potential. Moreover, the characteristics of the diversity of innovations and their demand allow us to describe *the results of the innovation potential development and implementation*.

The diversity of innovations and needs for them can be defined by considering these issues:

1. The innovation potential in the European Union should be oriented at innovations found in *all* spheres of social, economic and technological development as well as in political and cultural life:
 - the innovations in the area of *social development* should be oriented at spreading and establishing *humane and democratic values*, thereby seeking to create *a new knowledge-based society*;
 - the innovations in the area of *economic development* should be oriented at creating *up-to-date and competitive economy* relying on *knowledge-based economic models and standards*;
 - the innovations in the area of *technological development* should be oriented at creating *qualitatively new technologies* and their spreading in various spheres of life, primarily, at creating the *alternative power system and up-to-date manufacturing industry based on high technologies* in the European Union;
 - the innovations in *political area* should be oriented at the development of *civic society* in the EU and its Member-States, realization of *human rights and freedom* and pursuing *the policy meeting the actual needs of the society* in any particular country in the European Union;
 - the innovations in *cultural area* should be oriented at the establishment of *high moral standards* as well as *principles of environmentally friendly lifestyles and ethical behaviour* in all spheres of life.
2. The innovation potential in the European Union should be oriented at solving the problems significant to the *whole* European Union, with the priorities given to the solution of the most urgent problems:
 - *inadequate economic measures* aimed to support and increase the high level of welfare and social comfort standards of all inhabitants in the countries in the European Union (implying that they are being supported and raised to a smaller extent: inability to solve these problems may cause higher social differentiation and negative social and economic effects);
 - *insufficient competitiveness of the products made in the Member-States in the European Union in the international markets and all over the world* (these problems are associated with the growth of production costs in nearly all economic sectors, while the quality of the products does not grow correspondingly: for this reason, the competitiveness of these products is often low);
 - *deficiency and growing cost of power and raw materials* (these problems are associated with the fact that the economic system in the European Union is

- strongly affected by the growing cost of imported power and raw materials as well as the increasing deficiency of these resources);
- *ecological* problems which are actually encountered in all regions of the European Union and in all spheres of life;
 - various *safety* problems including *public safety* as well as safety problems associated with legal, environmental and social aspects, human rights, freedom, etc. (it can be noted that, in the modern society, safety is becoming the main value, therefore, the orientation of innovations at safety provision is perceived as an absolute priority. Another factor considered to be important throughout the human history should be mentioned: the main innovations ensuring the advance of society in all times were associated with safety provision, which could also be achieved by military actions).
3. Innovation potential in the European Union as a system should be oriented at its *sustainable and harmonious* development and *adaptation* to the environment and global qualitative transformations:
- innovation potential should be oriented at the *harmonious development of the all regions* in the European Union, implying that each region should be perceived as a *unique and specific unit, satisfying currently accepted standards*, as well as being *competitive* in the European Union space,
 - innovation potential in the European Union should be oriented at being intensively used for solving social, economic, environmental, safety and other problems on the *world-wide scale*, thereby ensuring the ability of the European Union as a system *to adapt to the environment in the global sense*.

The above and some other characteristics allow us to show *multifaceted orientation* of the innovation potential. On the other hand, it can be defined in a different way by showing its *complicated structure*. Structural characteristics of innovation potential allow us to define its *major elements* as well as *possibilities of innovation initiation, creation and dissemination*, thereby determining the *abilities* of creating and spreading the innovations and the *conditions* for developing and disseminating innovations and using innovation potential.

The described characteristics and their use allow us not only to see a *complex nature* of innovation potential, but also to reveal the possibilities of *activating* innovation development, dissemination and implementation. In this context, the following issues should be considered:

1. In the *structure* of the innovation potential, the following basic *elements* should be defined:
 - in the structure of *human resources* accumulated in the European Union, most of the resources are *oriented at the creative activities of all kinds and various innovations and initiatives*. The availability of this kind of human resources provides favourable conditions for innovative activities,

- an *up-to-date material base for industrial development and provision of services as well as technological infrastructure and infrastructure required for research, experimental work and practical implementation of innovations* have been created in the European Union,
 - *the infrastructure for supporting and promoting the innovations in various areas and the system aimed at the development of education, science and studies (including university and non-university studies)* have been developed in the European Union,
 - *friendly social, political, psychological, legislative and organizational environment for stimulating and developing innovations and management and administration infrastructure for supporting innovative activities* have been created in the European Union;
2. The development and effective use of innovation potential is closely connected with the *cultural potential and the variety of cultures* on the territory of the European Union:
- the cultures developed on the territory of the European Union can be *identified* based on *various criteria* (i.e. various *ethnic* cultures, the cultures based on various *confessions* and those advocated by various *social and professional groups and layers* as well as the culture of people in a *particular region*). Awareness of the *variety of cultures* is the key factor in innovation development,
 - different and differently identified cultural *achievements* accumulate *various opportunities* to develop and effectively use innovation potential: to activate and promote innovations, the opportunities provided by the *interaction and merging of different cultures* should be *effectively used* (the latter condition is considered to be the priority in developing the innovation potential).

Summing up the above statements, it can be noted that the diverse orientation and a complicated structure of the innovation potential reflect the main factors to be taken into consideration in solving the significant problems of activating and promoting innovations in order to accept globalization challenges.

2. Synergy effects as a precondition for the innovation activities and knowledge economy creation

The nature of innovations has been analyzed from various perspectives in a number of theories [Calori, Atamer, Nunes, 1999; Currie, 2000; Dicken, 1998; Ein-Dor, Myers, Raman, 2004; Gerber, 1999; Goeransson, Soederberg, 2005; Grace, Butler, 2005; Hunt, 2000; Huseman, Godman, 1999; Leidesdorff, 2004; Melnikas, 2002; Perraton, 2001, Porter, 1980, Olsen, Osmundsen, 2003; Watson, Gallagher, 2007]. They have shown that innovations are actually based on *searching for syner-*

getic effects and their use. This means that the solution of the problems of the creation, development and effective use of the innovation potential in the European Union requires that great attention should be paid to *searching for synergetic effects and promoting their use.*

It is well known that *synergetic effects* are obtained by *combining the elements of different nature into a single system and creating a qualitatively new situation, achieving qualitatively new aims or getting qualitatively new results.* Taking into consideration that in social, economic and cultural spheres of the European Union there are *good conditions for obtaining various synergetic effects,* we can *optimistically assess the prospects of purposeful development and effective use of the innovation potential.*

Assessing the prospects of purposeful development and effective use of the innovation potential, the following factors influencing the *achievement of synergetic effects* can be defined:

- the conditions created due to an *interaction* of various cultures developed in the area of the European Union. The *interaction* of cultures and mentalities characterized by various ethnic, confessional, social, professional, demographic, regional and other features means that *new lifestyles and social behaviour models,* as well as *processes of the formation and spreading of new values,* would be developed fast and to a great extent in the European Union spaces (the considered processes characterize innovations emerging in all spheres of political, social, economic and cultural life and reflect great prospects of innovation potential development);
- the conditions provided by the available *intellectual and creative abilities of human resources* on the territory of the European Union and the *amount and structure of scientific and practical knowledge relating to various spheres of life and activities.* The merging of the available human resources and their abilities with knowledge accumulated in various fields provides a possibility to *create and use new information,* thereby promoting and disseminating *innovations;*
- the conditions based on *technological potential of the industry in the European Union and other sectors of economy* as well as *industrial capacities* and infrastructure for using these capacities: by combining the elements of the technological potential and infrastructure as well as various *industrial capacities* into new interrelated entities, the necessary prerequisites are created for developing *qualitatively new production and service systems* which could operate in new organizational forms to create *qualitatively new products;*
- conditions created by the *political decision-making system in the European Union* used for *further integration and organizational, legislative, informational and economic infrastructure.* The European Union has quite a few ways of using human, financial, material and other resources *effectively and purposefully* and *coordinating* the implementation of innovative projects and other means important to

the whole European Union and aimed at producing long-term qualitative changes (it can be stated that a great potential of political decisions and organizational and administrative skills for achieving synergetic effects which can be used to initiate and implement large-scale innovations has been accumulated in the European Union),

- the conditions based on the *experience gained* by the institutions, enterprises and organizations of the Member-States of the European Union *in developing international links and cooperation in the global areas*: the experience gained and the systems of the relationships are considered to be a significant precondition for promoting and developing innovations.

The above circumstances and conditions allow us to reveal the *prospects* for extending the search for obtaining synergetic effects and their effective use, thereby increasing the innovation potential. It can also be emphasized that, actually, under all the above conditions, the stimulation, creation and dissemination of innovations may be based on the creation and development of the so-called *multidimensional international networks*.

It can be stated that the basis of the search and use of synergetic effects is *the creation and expansion of multidimensional international networks* consisting of enterprises, institutions and other organizations of various types and specializations as well as the activities of variously defined individuals and other subjects. It can also be noted that the operation of these networks can be strongly influenced by the use of modern information and telecommunication technologies as well as up-to-date automated devices and robots.

3. Creation and development of international networks for activating innovations: strategic decisions

Creation and development of international networks is considered to be the *priority trend* in activating innovations and increasing the performance efficiency of various enterprises and organizations under the conditions of globalization and development of knowledge-based society and knowledge economy. It is especially important development trend in the high technology sectors.

The most important examples of creating and developing *multidimensional international networks* influencing the innovation activation and promotion in the European Union in the globalization environment are as follows:

- *industrial and service systems* characterized by a *complex nature* and operating as *international networks*. In such systems, information and telecommunication technologies as well as automated devices and robots can be widely used, and *qualitatively new products* can be created and distributed;

- *complex systems* operating as *international networks* and aimed at *developing human resources* which accumulate the *functions of education, science and technological development* required to satisfy the creative needs of *knowledge-based society* in all spheres of life and to create the conditions for realizing the *principle of continuous (life-long) education*;
- *the systems* operating as *international networks* oriented at making *breakthroughs* and *creating qualitatively new situations* in various spheres of life.

The above *systems* functioning as *international networks* can be viewed as particularly important *models* to be applied to developing and upgrading of the innovation potential.

Complex industrial and service systems functioning as *international networks* are aimed at obtaining *synergetic effects* and *creating and disseminating innovations* in various ways:

- *joint activities systems* within the considered networks embrace various industrial, trade, logistics, transport, financial and insurance companies and enterprises and those providing marketing, auditing, consulting, legal services, staff training, etc. as well as other companies, enterprises, organizations and individuals. In such networks, *innovative organizational and management forms* required for developing *partnership and cooperation* as well as *new organizational structures control, self regulation, planning and work coordination methods and strategic decision-making models* can be used.
- *new kinds of products* including various *complex products* representing, actually, a new system of activities intended to yield *new results* and bring about *qualitative changes* in the areas of their application (the emphasis placed on the *complex* nature of the product allows us to expose the creation and implementation of innovations based on synergetic effects) can be created in the framework of these networks,
- highly *innovative technologies* and *organizational forms of a new type*, primarily, technologies aimed at implementing the principles of *automating and robotizing technological processes in international electronics and manufacturing, logistics and trade* can be created and used in the framework of these networks.

Creation and development of *industrial and service systems* functioning as *international networks* also accumulates a huge innovation potential because it can stimulate the *formation of economies at a qualitatively new technological level* in the global areas. *Complex products of a new kind* created based on new technologies can be used under these new economic conditions. The following *complex products of a new kind* are considered to be most important:

- *international systems of production and servicing capacities* intended for creating, manufacturing and spreading the available and newly created products as well as copying and servicing *new models and types of commodity items* in the global areas (e.g. systems of production and servicing capacities for producing and dis-

- tributing a certain new car or airplane model, a new type of technological equipment, home appliances, furniture, clothes and other consumer goods as well as foodstuffs);
- the available and newly created *energy production, mining, transportation, processing, distributing and delivery* systems (e.g. the systems for obtaining and transporting gas, oil and other natural resources as well as electricity, water and heat energy production, distribution and delivery, including international systems);
 - the available and newly created various transport systems, including *multimodal transport* systems;
 - the available and newly created *urban* systems (i.e. cities and towns, their districts, settlements, large industrial areas);
 - various types of *production and servicing capacities* in various branches of industry, agriculture, etc., as well as in various sectors of culture, education, health care and other spheres.

The creation and development of *industrial and service systems* in the form of international networks also stimulates the development of *qualitatively new economy at a higher technological level* in a sense that it allows closer *interrelationship and partnership* between the systems performing various functions to be developed. This applies to the systems with the *business* function as a priority and systems operating in the areas of *research, education and culture*.

Maintaining these links and cooperation results in the creation and development of *international networks of higher quality*, e.g. *complex systems for developing human resources* which should be aimed at satisfying the needs of creating *knowledge-based society and economy*. The main features of these systems are as follows:

- development of human resources is based on the *'life-long education' principle*, implying that every person can have an opportunity to continually improve his/her skills to satisfy the requirements of the developing economy, social life, science and technology as well as the society and life-styles of people;
- the priority issue of the development of human resources should be the *formation of the creative potential* for creating the conditions for developing *constructive visions of the future and realizing the future plans*;
- development of human resources should be perceived as a *continuous complex process embracing* a number of processes relating to education and studies as well as raising the level of one's professional skills in various areas, carrying out research, performing individual and group analytical and design work, acting as an executor or manager (leader) in various sectors and at various levels as well as increasing the competence and skills of acquiring various types of knowledge (as a *complex process*, development provides the conditions for every person to become a *harmonious personality*);
- *various institutions and organizations should be involved* in the development of human resources to perform the functions relating to education, studies, research,

professional training and consulting as well as *various enterprises and organizations*, where people work and gain the experience and competence in various fields (all the above-mentioned institutions, enterprises and organizations should *interact, operating as a network* intended to produce synergetic effects and innovations);

- the development of human resources should be oriented at *international priorities*, therefore, institutions and organizations involved in the process should operate as *international networks* (based on the networks of *universities, research institutes, parks of science and technologies, innovation centres* as well as *clusters of technologically-oriented organizations, etc.*, which are particularly important for satisfying the needs of the developing knowledge-based society and economy).

The features considered allow us to define the *complex systems which are intended for developing human resources* and their role in developing innovations under the conditions of globalization.

To characterize *the systems operating as international networks* more thoroughly, a specific type of systems operating as *international networks oriented at breakthroughs and the creation of qualitatively new situations in various spheres of life* should be mentioned.

The systems operating in the form of international networks aimed at breakthroughs and the creation of qualitatively new situations are particularly important in the *globalization environment*. Their specific character and importance depends on the following factors:

- the aim of these systems operating as international networks is to ensure that global and significant international problems associated with humanities, ecological, social, economic, technological development, international safety and other aspects relevant to the people of most countries and requiring their cooperation as well as joint efforts and resources should be successfully solved;
- various national and international organizations embracing state institutions, non-governmental organizations, national and international business and public sector organizations as well as other unions and individuals could make the structure of these systems;
- based on the created systems, various kinds of resources and capacities required for developing and executing *large international projects*, which could bring about breakthroughs and qualitative changes in various areas, can be integrated.

It can be stated that *systems operating in the form of international networks aimed at breakthroughs and creating of qualitatively new situations in various spheres of life* can be considered high-level networks: they can be treated as networks whose *innovative potential* is adequate to accept the challenges of globalization.

To sum up, it should be emphasized that all the systems described above, which can operate and are operating as international networks, can be considered *promising organizational forms* aimed at activating and spreading innovations in global spaces. This particularly applies to the conditions of the development and expansion of the European Union. It also implies that creation, development and use of the above international networks should be considered the priority issues of *activating and promoting innovations and increasing the innovation potential in the European Union*.

Conclusions and recommendations

The main condition, ensuring future economic growth and fast scientific and technological development in the European Union, is a purposeful development and effective use of innovation potential.

The innovation potential of the European Union is perceived as a very complicated system accumulating great possibilities of initiating, creating, disseminating and implementing innovations in all spheres of social, economic, scientific and technological development, especially in the high technology sectors.

Vast possibilities of activating innovations are provided by human and intellectual resources accumulated in the European Union and by its great production capacities in all economic sectors as well as highly developed infrastructure for activating and developing education, science and innovations, long-term practical experience in creating and developing high technologies and maintaining widespread international links. Key innovation activating factors are the variety of cultures and deep-rooted traditions of democracy and openness as well as trends of increasing integration and cooperation between nations.

Vast possibilities of activating innovations are created by favourable conditions existing in the European Union for producing and an effective use of various synergetic effects required for creating and developing international networks.

The following international networks are particularly important for activating innovations:

- *industrial and servicing systems* of complex nature operating now in the form of international networks in all sectors of the economy;
- complex systems operating as international networks which are aimed at *developing human resources* to satisfy the creative needs of knowledge-based society for *educational, scientific and technological development* in all spheres of life and for making favourable conditions to implement the principle of 'life-long' (continuous) education;
- systems operating in the form of international networks aimed at *making breakthroughs and creating new situations* in various spheres of life.

These international networks may become *the dominant formations* in the modern international economy.

Spreading of international networks implies the inevitability of *transformation of the international economy into an economic system of international networks*.

Under the conditions of the 'network' economy, *new factors* influencing the processes of initiation, creation, dissemination and implementation of innovations emerge. They are as follows:

- transformation of the existing forms of competition, when the former competitors become partners,
- a decreasing role of national dimensions,
- essential changes in the state participation in the economic development,
- an increasing role of strategic plans and programmes.

The above-mentioned issues are particularly important in assessing both the prospects of activating the innovations and establishing the priorities of increasing the innovation potential, which is required when it is necessary to respond to the challenges of the development and expansion of the European Union .

The problems of increasing the innovation potential in the European Union and its effective use are very complicated, therefore, their comprehension and solution require further complex investigation.

Summary

In the time of globalization, economic conditions and prospects of the economic development are getting more heavily dependent on the ability to initiate, disseminate and implement *innovations* in all spheres of life. This factor is of particular importance for the development and expansion of the European Union, because an *activation of innovations* is considered to be a significant problem associated with social and economic development and the advance of science and technology in the European Union.

Further activation of innovations is a major precondition for ensuring the competitiveness of the European economy under the conditions of globalization.

To activate the innovations in the European Union, *the potential of innovations should be purposefully developed and effectively used*. This is not only a major condition of successful development of *the economy in the European Union* , but also a major factor influencing the solution of the *significant global problems of economic development and technological advance*. The importance of the innovation potential in the European Union for economic development and technological advance in the world is determined by the current role of the European Union and its influence on global changes.

The problems of purposeful development and effective use of the innovation potential are considered now to be particularly *important* both from *theoretical* and *practical* perspectives. Therefore, these problems are in the focus of many research and practical works.

However, it should be noted that, so far, the discussion and solution of some particular problems have not been paid much attention. Thus:

- a *dimension for describing the peculiar features of the innovation potential of the European Union* as a complex cultural, economic, technological as well as political and social system and space has not been suggested by researchers yet;
- in the process of innovation initiation, dissemination and implementation, various possibilities of achieving *synergetic effects*, also including the possibilities characteristic *only* of the European Union, have not been thoroughly considered;
- modern theories of innovation and innovation management do not offer a comprehensive analysis of the ways of creating and implementing innovations aimed at achieving *technological breakthroughs* and *qualitative changes* in the significant spheres of life of the community based on various *synergetic effects*;
- the lack of attention to the problem of *creating international network systems*, closely associated with activation of innovations, can be observed both in practical activities and modern theories;
- there is a lack of awareness that the international economy *is being transformed into a network-based economic system* and the influence of this transformation on the *innovation activation* has not been adequately evaluated.

The innovation potential of the European Union is perceived as a *very complicated system* accumulating *great possibilities* of initiating, creating, disseminating and implementing innovations in all spheres of social, economic, scientific and technological development.

Vast possibilities of activating innovations are provided by human and intellectual resources accumulated in the European Union and by its great production capacities in all economic sectors as well as highly developed infrastructure for activating and developing education, science and innovations, long-term practical experience in creating and developing high technologies and maintaining widespread international links. *Key innovation activating factors* are the variety of cultures and deep-rooted traditions of democracy and openness, as well as trends of increasing integration and cooperation between nations.

Vast possibilities of activating innovations are created by favourable conditions existing in the European Union for producing and effective use of various *synergetic effects* required for *creating and developing international networks*.

The following international networks are particularly important for activating innovations:

- *industrial and servicing systems* of complex nature operating now in the form of international networks in all sectors of economy;
- complex systems operating as international networks, which are aimed at *developing human resources* to satisfy the creative needs of knowledge-based society for educational, scientific and technological development in all spheres of life and for making favourable conditions to implement the principle of 'life-long' (continuous) education;
- systems operating in the form of international networks aimed at *making breakthroughs* and *creating new situations* in various spheres of life.

These international networks may become *the dominant formations* in modern international economy.

Spreading of international networks implies the inevitability of *transformation of international economy into an economic system of international networks*.

Under the conditions of the 'network' economy, *new factors* influencing the processes of initiation, creation, dissemination and implementation of innovations emerge. They are as follows:

- transformation of the existing forms of competition, when the former competitors become partners,
- a decreasing role of national dimensions,
- essential changes in the state participation in the economic development,
- an increasing role of strategic plans and programmes.

The above-mentioned issues are particularly important in assessing both the prospects of activating the innovations and establishing the priorities of increasing the innovation potential, which is required when it is necessary to respond to challenges of the development and expansion of the European Union.

The major goal of the paper is to demonstrate new approaches to innovation activation and purposeful development of the innovation potential in the European Union, taking into account the trends of globalization observed and the challenges of the knowledge-based society being created.

The major tasks of the paper consist in:

- identifying the challenges of the *innovation activation* under the conditions of the growing globalization and defining a concept of *innovation potential in the European Union*;
- demonstrating the main peculiar *features of the innovation potential in the European Union*;
- evaluating the possibilities of identifying and achieving *synergetic effects* under the conditions of the development of *international network systems* and showing the role of *international networks in activating innovations*;
- describing a *new type of transformations* taking place in the development of international economy, demonstrating an increasing *domination and significance of international network systems*.

The problems of increasing the innovative potential of the European Union and its effective use are very complicated, therefore, their comprehension and solution require further complex investigation.

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