



## NETWORK-BASED INTERNATIONAL ECONOMY: INNOVATION POTENTIAL IN THE EUROPEAN UNION

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**Abstract.** Prospects of economic development are becoming 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 *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*. 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. *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*: 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*.

*The major goal of the paper* is to demonstrate the 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.

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**Reikšminiai žodžiai:** inovacijos, potencialas, tarptautinė ekonomika, tinklai, Europos Sąjunga.

### Introduction

Now, in the time of globalization, the economic conditions and prospects of 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 *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 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, not much attention has been paid to discuss and solve some particular problems. 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 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 transformations will be presented below.

### **1. The significant role of developing the innovation potential in the European Union and its effective use under the conditions of economic internationalization and globalization**

The role of 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, Nunesw, 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, Jakubavičius, 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 effecti-

ve 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 the *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 the effective use of the innovation potential as a system* make an *important area of research and practical work*.

## 2. A concept and major dimensions of innovation potential in the European Union

In general, *a 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 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 *many-sided orientation*,

- the innovation potential of the European Union has a *complicated structure*.

*Many-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 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 residents 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 modern society safety is becoming the main value, therefore, the orientation of innovations at safety provision is perceived as 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 all the 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 area,
- 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 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 condi-

on 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.

### 3. Synergetic effects in the development and upgrading of the innovation potential in the European Union

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 synergetic 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 *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 pro-

- cesses 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.

#### **4. Creation and development of international networks for activating innovations**

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-based economy .

The most important examples of creating and developing *multidimensional international networks* influencing innovation activation and promotion in European Union in 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, commercial, 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 distributing 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 *business function* as a priority and systems operating in the areas of *research, education and culture*.

Maintaining of 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 econo-

- my, 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, individual and group analytical and design work, acting as 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 *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 *purposeful development and effective use of innovation potential*.

*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 '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 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 problems of increasing the innovative 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, the economic conditions and prospects of economic development are becoming 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 *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 adequately addressed. 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 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.

*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 inter-

national 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 '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 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 the new approaches to innovation activation and pur-

poseful 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*.

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.

## References

1. Altwater, E.; Mahnkopf, B. 1996, *Limits of Globalization: Politics, Economy and Ecology in the World Society* – Muenster, Verlag Westfalisches Dampfboot, p. 633.
2. Boldrin, M.; Canova, F. 2001. “Inequality and convergence in Europe’s regions: reconsidering European regional policies”, *Economic Policy*, Vol.16, issue 32, p. 205.
3. Bond, E.; Syropoulos, C.; Winters, L. A. 2001. “Deepening of regional integration and multilateral trade agreements”, *Journal of International Economics*, vol.53, issue 2, p. 335–361.
4. Calori, R., Atamer, T., Nunes, P. 1999 *The Dynamics of International Competition* – London, Sage Publications, 256 p.
5. Chortareas, G.E., Pelagidis, T. 2004, “Trade flows: a facet of regionalism or globalisation?” *Cambridge Journal of Economics*, vol.28, pp. 253-271.
6. *Cultures in Central and Eastern Europe* / Ed. M. Bateman. 1997, Oxford, Boston, Butterworth – Heinemann, 238 p.
7. Cohendet, P.; Stojak, L. 2005. “The digital divide in Europe. The economic and social issues related to “knowledge-based Europe”, *Futuribles: Analyse et Prospective*, issue 305, p. 5–28.
8. Currie, W. 2000, *The Global Information Society* – Chichester, John Wiley, p. 288.
9. David, P. A.; Foray, D. 2002. “An introduction to the economy of the knowledge society”, *International Social Science Journal*, issue 171, p. 5–9.
10. Dicken, P. 1998, *Global Shift: Transforming the World Economy* – London, Sage Publications; A. Paul Chapman Publishing, p. 512.
11. Ein-Dor, P.; Myers, M.; Raman, K. S. 2004 “IT industry and the knowledge economy: A four country study”, *Journal of Global Information Management*, vol. 12, issue 4, p. 23–49.
12. Farnsworth, K. 2005, “Promoting Business-centred welfare: International and European Business Perspectives on Social Policy”, *Journal of European Social Policy*, vol. 15, issue 1, p. 65–80.
13. Friedman, T. L. 2005. *The World is Flat: the Globalized World in the Twenty-First Century* – London, Penguin books, p. 660.
14. Gerber, J. 1999. *International Economics*-Amsterdam, Addison Wesley Longman, p. 512.
15. Ghose, A. K. 2004, “Global Inequality and International Trade”, *Cambridge Journal of Economics*, vol.28, issue 2, p. 229–252.
16. Goeransson, B.; Soederberg, J. 2005. “Long Waves and Information Technologies – On the Transition towards the Information Society”, *Technovation*, vol. 25, issue 3, p. 203–211.
17. Grace, A.; Butler, T. 2005. “Beyond Knowledge Management: Introducing Learning Management Systems”, *Journal of Cases on Information Technology*, vol. 7, issue 1, p. 53–70.
18. Hayo, B.; Seifert, W. 2003. “Subjective economic well-being in Eastern Europe”, *Journal of Economic Psychology*, vol.24, issue 3, p. 329–348.
19. Hofbauer, H. 2003. *Osterweiterung. Vom Drang nach Osten zur peripheren EU – Integration* – Wien, Promedia, 240S.
20. Hummels, D.; Ishii, J., Kei-Mu Yi. 2001. “The Nature and Growth of Vertical Specialization in World Trade”, *Journal of International Economics*, vol.54, p. 75–96.
21. Hunt, S. D. 2000. *A General Theory of Competition: Resources, Competences, Productivity. Economic Growth*–London, Sage Publications, 256p.
22. Huseman, R. C.; Godman J. P. 1999. *Leading with Knowledge: The Nature of Competition in 21 st. Century*–London, Sage Publications, p. 272.
23. Yarbrough, B. V.; Yarbrough, R. M. 1999, *The World Economy; Trade and Finance* – Chicago, The Dryden Press, p. 758.
24. Johnson, D.; Turner, C. 2006, *European Business* – London, Routledge , p. 456.
25. Krugman, P.; Obstfeld, M. 1997, *International Economics* – Amsterdam, Addison Wesley Longman, p. 800.
26. Lavingne, M. (1995), *The Economics of Transition: From Socialist Economy to Market Economy* – London, Macmillan Press, p. 295.

27. Leydesdorff, L. 2004. "The University – Industry Knowledge Relationship: Analyzing Patents and the Science Base of Technologies", *Journal of the American Society for Information Science and Technology*, vol. 55, issue 11, p. 991–1001.
28. McNally, R. 1999, *The Comprehensive World Atlas* – Stamford, Longmeadow Press, p. 224.
29. Melnikas, B. 1997, "The Integrations Problems of the Baltic States: Possibilities for the Formation of a Unified Technological, Economic and Social Space" *East West Scientific Cooperation. Science and Technology Policy of the Baltic States and International Cooperation*. NATO ASI Series, 4, Science and Technology Policy. – Dordrecht; Boston: Kluwer Academic Publisher, Vol.15. p. 33–51.
30. Melnikas, B. 1999. Probleme der Integration der baltischen Staaten in westliche Strukturen (Berichte des Bundesinstituts fuer ostwissenschaftliche und internationale Studien), N 40, Koeln, 1999, 42 S.
31. Melnikas B.; Jakubavičius, A.; Strazdas, R. 2000. *Inovacijos: verslas, vadyba, konsultavimas* – Vilnius, Lietuvos inovacijų centras, p. 240.
32. Melnikas, B. 2002, *Transformacijos*. – Vilnius, Vaga, 750 p.
33. Melnikas, B., Reichelt, B. 2004. *Wirtschaft und Mentalitaet : Tendenzen der EU-Osterweiterung* – Leipzig, Leifim – Verlag, 159S.
34. Melnikas, B. 2007, 'An Integral Cultural Space in Europe and New Challenges for its Economic Development', *Ekonomika (Economics)* – Vilnius University, vol.78, p.98–114.
35. Merrill, R. E., Sedgwick H.D. 1997, *The New Venture Handbook* – New York, Amacom, 256p.
36. Olsen, T.E., Osmundsen, P. 2003, "Spillovers and International Competition for Investments", *Journal of International Economics*, vol.59, issue 1, p. 211–238.
37. Parker, B. 1998, *Globalisation and Business Practice: Managing Across Boundaries* - London, Sage Publications, 672 p.
38. Perraton, J. 2001. "The Global Economy – Myths and Realities", *Cambridge Journal of Economics*, vol. 25, p. 669–684.
39. *Politische und oekonomische Transformation in Ost-europa / Hrsg. G.Brunner*, (2000), Baden Baden, Nomos, 252 S.
40. Porter, M. 1980, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* – New York, The Free Press, 396 p.
41. Redding, S., Venables, A.J. 2004, "Economic Geography and International Inequality", *Journal of International Economics*, vol. 62, issue 1, p. 53–82.
42. Rosenzweig, P. 2001, *Accelerating International Growth* – Chichester, John Wiley, 275 p.
43. Sangmon, K. 2002, "A Longitudinal Analysis of Globalization and Regionalization in International Trade: Social Network Approach", *Social Forces*, vol. 81, N2, p. 445–471.
44. Silbiger, S. 2007, *The 10-Day MBA: A Step-by Step Guide to Mastering the Skills Taught in Top Business Schools* – London, Piatkus books, 420 p.
45. Steinmueller, W.E. 2002. "Knowledge-based Economies and Information and Communication Technologies", *International Social Science Journal*, issue 171, p. 141–154.
46. *The Sustainability of Long – Term Growth: Socioeconomic and Ecological Perspectives / Ed. M. Munasinghe, O.Sunkel, C de Miguel*, 2001 – Cheltenham, Edward Elgar Publishing, 464 p.

## TINKLŲ PLĖTOJIMU GRINDŽIAMA TARPTAUTINĖ EKONOMIKA: INOVACIJŲ POTENCIALAS EUROPOS SAJUNGOJE

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**Santrauka.** Ekonominę padėtį ir ekonominės raidos perspektyvas globalizacijos aplinkoje vis didesniu mastu lemia gebėjimas visose gyvenimo srityse inicijuoti, skleisti ir įgyvendinti *inovacijas*. Ši aplinkybė itin reikšminga Europos Sąjungos raidos ir plėtros sąlygomis: būtent Europos Sąjungoje *inovacijų aktyvinimas* yra vertintinas kaip ypač aktuali tolesnės socialinės ekonominės raidos ir mokslo bei technologijų pažangos problema.

Tolesnis inovacijų aktyvinimas yra esminė prielaida užtikrinti Europos Sąjungos ekonominės sistemos konkurencingumą globalizacijos aplinkoje.

Siekiant aktyvinti inovacijas Europos Sąjungoje būtina *kryptingai plėtoti ir veiksmingai panaudoti inovacijų potencialą*. Inovacijų potencialo Europos Sąjungoje plėtojimas ir efektyvus panaudojimas yra esminė sąlyga ne tik siekiant tobulinti *Europos Sąjungos ekonomiką*, bet ir svarbus veiksnys sėkmingai sprendžiant *aktualias ekonominės raidos ir technologijų pažangos problemas globaliu mastu*: inovacijų potencialo Europos Sąjungoje reikšmingumą ekonominei raidai ir technologijų pažangai viso pasaulio mastu lemia šiuolaikinis Europos Sąjungos vaidmuo ir jos įtaka globaliu mastu vykstantiems pokyčiams.

Inovacijų potencialo Europos Sąjungoje kryptingo plėtojimo ir efektyvaus panaudojimo klausimai šiuo metu yra vertinami kaip išskirtinai *aktualūs* tiek *teorine*, tiek *praktine* prasme, šiems klausimams skiriama labai daug dėmesio daugelyje mokslinių tyrimų ir praktinių darbų. Vis dėlto pasakytina, kad kai kuriems aktualiems klausimams aptarti ir spręsti iki šiol buvo skiriama aiškiai nepakankamai dėmesio:

- mokslinėje literatūroje iki šiol nebuvo pasiūlyta *inovacijų potencialo Europos Sąjungoje dimensija*, orientuota į Europos Sąjungos, kaip sudėtingos kultūrinės, ekonominės, technologinės, politinės ir socialinės sistemos ir erdvės, *ypatumams* išryškinti;
- inovacijų inicijavimo, skleidimo ir įgyvendinimo praktikoje nėra reikiamu mastu atsižvelgiama į daugialypes *sinergetinių efektų* gavimo ir raiškos galimybes, tarp jų ir galimybes, *išskirtinai* būdingas Europos Sąjungai;
- šiuolaikinėse inovacijų ir jų vadybos teorijose nėra reikiamu mastu išnagrinėtos galimybės atsižvelgti į įvairius *sinergetinius efektus* kurti ir įgyvendinti inovacijas, orientuotas į *esminius technologinius proveržius* bei į *kokybinius pokyčius* šiuolaikinei visuomenei svarbiose gyvenimo srityse;
- tiek praktinėje veikloje, tiek ir šiuolaikinėse teorijose stokojama dėmesio tokiam inovacijų aktyvinimo požiūriu reikšmingam reiškiniui kaip *tarptautinių tinklų tipo organizacijų kūrimasis ir veiklos plėtojimas*, nėra suvokiama, kad tarptautinėje ekonomikoje iš esmės vyksta *transformacija į tinklų tipo ekonominę sistemą* ir nėra įvertinamas šios transformacijos poveikis *inovacijų aktyvinimo srityje*.

*Išskirtinai didelės galimybės aktyvinti inovacijas* lemia Europos Sąjungoje sukaupti žmogiškieji ir intelektualiniai ištekliai, didžiuliai gamybiniai pajėgumai visose ekonomikos sektoriuose, išplėta mokslo, studijų bei inovacijų aktyvinimo infrastruktūra, didžiulis praktinis patyrimas aukštųjų technologijų kūrimo ir skleidimo srityje, išplėtoti tarptautiniai ryšiai. *Svarbūs inovacijų aktyvinimo veiksniai* yra kultūrų įvairovė, susiklosčiusios atvirumo ir demokratiškumo tradicijos, taip pat tolesnės integracijos ir aktyvesnio tarptautinio bendradarbiavimo polinkiai.

*Išskirtinai didelės galimybės aktyvinti inovacijas* lemia Europos Sąjungoje susiklosčiusios prielaidos gauti ir tinkamai panaudoti daugialypius *sinergetinius efektus*, kuriuos gali lemti *tarptautinių tinklų tipo organizacijų kūrimas ir plėtojimas*.

Aktyvinant inovacijas ypač reikšmingais laikytini tokie tarptautiniai tinklai:

- *pramonės ir paslaugų teikimo* sistemos, pasižyminčios kompleksiniu pobūdžiu ir veikiančios tarptautinių tinklų pavidalu visuose šiuolaikinės ekonomikos sektoriuose;
- tarptautinių tinklų pavidalu veikiančios kompleksinio pobūdžio *žmogiškųjų išteklių ugdymo* sistemos, kuriose siekiama sutelkti *žiniomis grindžiamos visuomenės kūrimo poreikius* realizuojančias *švietimo, mokslo ir studijų bei technologijų pažangos* visose gyvenimo srityse funkcijas bei sudaryti prielaidas įgyvendinti *mokymosi visą gyvenimą principą*;
- tarptautinių tinklų pavidalu veikiančios sistemos, orientuotos į *esminius proveržius* ir į *kokybiškai naujų situacijų sudarymą* įvairiose gyvenimo srityse.

Tokie tarptautiniai tinklai šiuolaikinėje tarptautinėje ekonomikoje gali tapti *vyrąjančiais subjektais*.

Tarptautinių tinklų tipo organizacijų paplitimas lemia *šiuolaikinės tarptautinės ekonomikos virsmo į tinklų ekonomikos sistemą* neišvengiamumą.

Tinklų ekonomikos sąlygomis gali pasireikšti *naujos aplinkybės*, turinčios įtakos inovacijų inicijavimo, kūrimo, sklaidos ir įgyvendinimo procesams:

- konkurencijos formų virsmas į buvusių konkurentų sąveiką ir partnerystę,
- nacionalinių dimensijų reikšmingumo sumažėjimas,
- valstybių vaidmens ekonominiame gyvenime esminiai pokyčiai,
- strateginio planavimo ir programavimo reikšmingumo didėjimas.

Minėtų klausimų sprendimo idėjos bei autoriaus atliktų tyrimų rezultatai išdėstyti šiame straipsnyje.

*Straipsnio tikslas* – atskleisti naujas galimybes aktyvinti inovacijas bei kryptingai plėtoti inovacijų potencialą Europos Sąjungoje, ypač atsižvelgiant į šiuolaikinius globalizacijos bei žiniomis grindžiamos visuomenės kūrimosi iššūkius.

*Pagrindiniai publikacijos uždaviniai:*

- identifikuoti globalizacijos procesų skatinamus iššūkius *aktyvinti inovacijas* bei apibrėžti *inovacijų potencialo Europos Sąjungoje sąvoką*;
- išryškinti svarbiausius *inovacijų potencialo Europos Sąjungoje ypatumus*;
- įvertinti *sinergetinių efektų* gavimo ir raiškos galimybes, atsirandančias *tarptautinių tinklų tipo organizacijų* kūrimosi ir plėtos sąlygomis, atskleisti *tarptautinių tinklų* vaidmenį *aktyvinant inovacijas*;

- apibūdinti tarptautinėje ekonomikoje vykstančias *naujo tipo transformacijas*, rodančias *tarptautinių tinklų išsivyravimą bei įtakos didėjimą*.

Detaliai pateikiami inovacijų potencialas Europos Sąjungoje, taip pat naujo tipo transformacijos tarptautinėje ekonomikoje teiginiai.

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