

THE KNOWLEDGE ECONOMY AND THE ACTIVATION OF SCIENTIFIC AND TECHNOLOGICAL PROGRESS: CONTEMPORARY CHALLENGES

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Abstract. *This article is dedicated to the problems and processes of the activation of scientific and technological progress in the context of contemporary challenges of the creation of a knowledge-based society and knowledge economy. The main focus here is on activating innovations, scientific and technological progress and creating various preconditions for the development of a knowledge-based society and knowledge economy.*

The contemporary processes and phenomena of innovations of scientific and technological progress and of its activation are analyzed in a complex manner; the needs for the purposeful activation and acceleration of scientific and technological progress, in particular in response to the aspirations of the knowledge-based society and the creation of a knowledge economy, are investigated in the presented material.

The role and importance of innovation activities and the acceleration of scientific and technological advance in the context of the creation of a knowledge-based society and a knowledge economy are revealed and highlighted. New ideas of the search and use of synergetic effects, as well as a new theoretical approach based on the so-called universal principle of the creation of a "new quality," are described.

The results of the presented research can be used for preparing practical recommendations and methodologies that could be applied in the creation and implementation of the managerial and economic instruments and support systems aimed at the purpose of activating the processes of innovations and scientific and technological progress. These recommendations and methodologies could also be utilized in the development of international relations in the context of what is required in the creation of a knowledge-based society and knowledge economy.

It is shown that the problems and processes of scientific and technological progress can be appreciated as an extremely important and viable field of scientific research on the creation and development of a knowledge economy.

Keywords: *knowledge economy, scientific and technological progress, innovation, synergy, networking.*

Introduction

The knowledge economy and the processes of its creation are understood and appreciated in the recent time as a very promising area in the modern science of economics. Due to this, it is very important to highlight, justify and develop those trends and directions in the development and dissemination of modern and innovative ideas of creating the

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knowledge economy and the knowledge economics, which could be defined as of particular significance and promise.

Undoubtedly, the trends and directions of studies that express the priorities of scientific and technological progress and orientations for accelerating technological advancement should be noted as the most promising among the trends and directions in the development of knowledge economics in general: scientific research on scientific and technological progress and on the acceleration of technological advancement can be defined as an extremely important and significant field in the structure of the science of knowledge economics.

The trends and directions of the research that expresses the priorities of scientific and technological progress and orientations for accelerating technological advancement, should be defined and described as extremely important and significant because the progress of science and technology is gaining an ever-increasing role in the life of contemporary society: the scientific and technological progress and its activation is a key factor for modernizing the contemporary society and increasing the efficiency and growth of the economy.

It goes without saying that priority attention should be given to issues regarding the research on scientific and technological progress, as well as to the processes of the acceleration of scientific and technological progress, in order to purposefully develop knowledge economics and the science of the knowledge-based society and knowledge economy.

It is obvious that the processes of scientific and technological progress can be understood as a very important and significant area of scientific research focused on the development of a knowledge-based society and knowledge economy.

The main problem that is being investigated in the material of this publication is that the main theoretical approaches existing in modern science that are used for the development of a knowledge-based society and knowledge economy, as well as those utilized in knowledge economics, are not sufficiently adequate for the contemporary needs and challenges of scientific and technological progress. The essence of the problem also lies in that the practice lacks some substantive theoretical solutions and concepts that allow for the development and use of effective support systems for the scientific and technological progress.

The main hypothesis aimed at solving this problem is that scientific and technological progress must be investigated and identified as an economic phenomenon with specific patterns and regularities, and that the key conditions and possibilities for the purposeful activation of scientific and technological progress must be comprehensively defined, especially taking into account the contemporary factors of globalization, European integration and of the development of a knowledge-based society and knowledge economy.

The object of the research is the processes of scientific and technological progress in the context of the needs posed by the modernization of the contemporary society as well as of contemporary economy and social life. The main focus is put on the ideas of the activation and acceleration of the processes of scientific and technological progress, on the ideas of the search and use of various forms of synergy and synergetic effects as well as on the ideas of networking and innovation activities.

The tasks of the research are the following:

1. To explore the role and importance of the processes of innovations and scientific and technological progress in the context of the contemporary challenges of globalization, European integration and the creation of a knowledge-based society and knowledge economy, also delving into this issue regarding the context of the needs of improving and developing the activities of research on the knowledge-based society and knowledge economy creation processes and on the knowledge economics in general;
2. To describe the role and importance of the principle of “a new quality” in activating and accelerating scientific and technological progress and innovations as well as in the search for and use of synergies and synergetic effects;
3. To determine the main priorities of networking in the context of contemporary changes and challenges as well as in the context of the needs of activating and accelerating scientific and technological progress and innovations.

The methodology of the research is based on the ideas of the complexity of scientific cognition of the quantitative and qualitative changes as well as on the use of the methods and models of investigation and complex analysis of the processes of social and economic development.

The results of the scientific research are presented in this publication.

1. Scientific and Technological Progress as an Especially Prospective Field in Knowledge Economics: Contemporary Challenges

The knowledge economics and various studies oriented toward the scientific cognition of the processes of the creation of a knowledge-based society and knowledge economy have been recently perceived as an essential part of the traditional science of economics and as a viable and prospective field of fundamental and applied scientific research of the economic profile. Also, the concept and definition of *knowledge economics* is rather new; it is still not defined unambiguously, definitively and indisputably.

It is also evident that *the knowledge economics* and the research activities and academic studies devoted to it, as to a relatively new field, have become more and more widespread in the recent times.

Taking into account the fact that the concept and definition of the knowledge economics has not been defined unambiguously so far, various approaches and descriptions of this concept and the definition are possible.

One of the possible versions of such a concept or definition is that the understanding of the essence of the knowledge economics is based on the idea that the combination of the words “knowledge” and “economics” in the whole denotes two orientations:

1. Toward the scientific cognition and knowledge about the creation and development of the *qualitatively new economy* and *various qualitatively new economic systems*, when the novelty of the economy or economic system is based on the *new knowledge about the new factors of economic growth and efficiency*. Such scientific cognition and knowledge about the creation and development of a qualitatively new economy and various qualitatively new economic systems should include a broad and deep understanding of various processes of exploring, designing, creating and developing a structure of particular economic objects or different economic systems as well as a reasonable identification of phenomena and regularities that reflect the creation and development of a qualitatively new economy and economic systems;
2. Toward *the dynamism of economic life*, especially toward those social, economic and technological changes that are determined by the search and use of new scientific knowledge and by the creation and dissemination of new technologies.

From this point of view, it can be said that the concept and definition of the knowledge economics can be defined and described as expressing and representing the scientific and practical activities oriented to the new knowledge on the structures and changes of various economic systems and objects of economic activities, about the trends and structures of the processes of economic development as well as to the processes of exploring, designing or creating and developing new structures in various fields and systems of economic life.

Obviously, it can be argued that the essence of knowledge economics, as of a science, reflects the orientation to the dynamism of economic activities and the qualitative changes in economic life.

In turn, given the fact that the processes of scientific and technological progress always are at the core of the dynamics of economic systems and of the changes in economic life in general, it can be argued that scientific research, academic studies and practical activities, oriented toward the processes of scientific and technological progress and its acceleration and activation, could be defined as the main priority in the complex of scientific research, academic studies and practical activities, combined under the general title of Knowledge Economics. The conclusion of this statement is that the processes of scientific and technological progress and the possibilities for the activation and acceler-

ation of these processes can be regarded as an essential priority of scientific research on knowledge economics.

In general, the processes of scientific and technological progress and its acceleration and activation could be described as a complex of various changes and development processes, oriented toward an essential and qualitative technical, technological and organizational improvement in all sectors and fields of social and economic life. The various changes and development processes, oriented toward an essential and qualitative technical, technological and organizational improvement in various systems, sectors and fields, should be defined as the main factors and characteristics of the dynamics in contemporary social and economic life.

These ideas and priorities reflect the role of scientific research on the processes of scientific and technological progress and its activation and acceleration in the general context of activities in the field of academic studies and scientific research on knowledge economics.

In turn, it should be noted that research on the processes of scientific and technological progress and its activation and acceleration includes a very wide range of topics and issues. The following as particularly important topics and issues could be noted, especially – under contemporary conditions of globalization, European integration, the development of a knowledge-based society and knowledge economy:

1. An orientation toward the solution of those problems of the society and its progress, which are most significant and particularly important to contemporary societal development (Altwater, Mahnkopf 1996; Boldrin, Canova 2001; Chortareas, Pelagidis 2004; Currie 2000; David, Foray 2002; Dicken 1998; Farnsworth 2005; Garrett, Mitchell 2001; Gerber 1999; Goeransson, Soederberg 2005; Grace, Butler 2005; Hayo, Seifert 2003; Hofbauer 2003; Hummels, Ishii, Kei-Mu Yi. 2001; Hunt 2000; Huseman, Godman 1999; Krugman, Obstfeld 1997; Leydesdorff 2004; Olsen, Osmundsen 2003; Perraton 2001; Redding, Venables 2004; Rosenzweig 2001; Sangmon 2002; Steinmueller 2002; Melnikas, Reichelt 2004; Melnikas 2002; 2011; 2013; 2017);
2. The development of conditions and assumptions as well as the preparation and use of effective tools and measures for a purposeful activation of scientific and technological progress (Melnikas 1997; 1999; 2014; Melnikas et al. 2000).

In turn, the following can be specified as particularly significant social and economic issues of the contemporary society:

1. Issues regarding the availability of raw materials and energy resources, natural raw materials and energy-saving issues as well as the issues related to the efficient use of the natural raw materials and energy resources. These problems are particularly relevant in the European Union and the European economic area in general,

because the European economy is exclusively dependent on the conditions of the import of natural raw materials and energy resources;

2. Issues regarding a sustainable social, economic and ecological development and issues related to economic growth taking into account the adequacy of the processes of economic development to the needs of social stability and a high quality of life. These issues are particularly relevant in the context of the rise of the social and economic differentiation in the contemporary world;
3. The recent issues regarding competition and competitiveness that arise in the context of contemporary globalization and economic internationalization. Particularly significant are the issues caused by excessive differences in productivity, purchasing power and in the conditions of economic and business activities in different regions and countries;
4. Issues the essence of which lies is the increasing differences between the expectations and the opportunities for realizing them in many areas of social and economic life. These issues create preconditions for conflicts and unsustainable development in many areas of social and economic life, in various sectors of economy and business and in many regions and countries.

It is clear that the solution to all these problems must be based, in particular, on the tools, measures and capabilities of the scientific and technological progress: these tools, measures and capabilities must be orientated toward the following:

1. Toward finding and to implementing various alternatives to the use of the limited raw materials and energy resources and increasing the efficiency of the use of these materials and resources;
2. Toward implementing the objectives of sustainability and achieving the needs of sustainable social, economic and ecological development in particular;
3. Toward achieving a high level of competitiveness in all areas of economic activity as well as toward implementing various ambitious standards of high quality, prosperity and social comfort;
4. Toward reducing various social and economic differentiations and toward eliminating the preconditions of various conflicts and exclusions.

The listed needs and aspirations for solving the described social, economic and other problems show and allow us to highlight the *priorities* of the creation of the conditions and assumptions, as well as of the preparation and use of effective tools and measures, for a purposeful activation of scientific and technological progress. It goes without saying that such priorities reflect the prospects of the research on scientific and technological progress as well as the prospects for the research on knowledge economics in general.

Taking into account the contemporary challenges of globalization, European integration, the development of a knowledge-based society and knowledge economy, the em-

phasis on scientific and technological progress should be placed in new ways of changes and development, with the priority being given to innovations and their spreading. New ways of changes and development and the spread of innovations should be based on recent achievements in synergetics, which should be applied to the creation and use of new forms of organization and managerial activities in various areas of modern social and economic life.

A theoretical basis for new ways of changes and development, with the priority given to the scientific and technological progress, innovations and their spreading could be created based on the solution of the problems associated with searching for synergy and synergetic effects, their identification and implementation. In its turn, the solution of the problems associated with the search for synergy and synergetic effects, their identification and implementation can be based on modern and prospective ideas and concepts, focused on and oriented toward the scientific and technological progress and its initiation, activation and acceleration: these ideas and concepts could be described more in detail.

2. Scientific and Technological Progress and Innovations: Synergetic Effects, Universal Principle of the Creation of a “New Quality,” Integration and Synthesis

Scientific and technological progress, innovations and their dissemination as a key priority of further societal development and modernization could be defined as an especially important and complicated system of the processes oriented toward the formation of a brand new society and a qualitatively new life style: these processes, especially in the context of the problems and processes of globalization and European integration, of the development of a knowledge-based society and knowledge economy, as well as in the context of the contemporary changes in the European Union, are described in detail in many previous publications (Melnikas 2011; 2013; 2014; 2017).

It could be noted that the processes of scientific and technological progress, innovations and their spread can in general be described as a system that is reflected and oriented toward a striving for a new quality in the following two aspects:

1. The society- and economy-based priorities of scientific and technological progress, innovations and their dissemination are being formed, which, if compared to the “traditional” society and economy, could be by all means considered as *qualitatively new*;
2. The formation of a society and an economy based on the priorities of scientific and technological progress, innovations and their dissemination that would reflect new trends in the development of a global space, which means that qualitative changes would be taking place in a contemporary world environment.

In examining and assessing the prospects for the development of a society and an economy, and, in particular, taking into account the priorities of scientific and technological progress, innovations and their dissemination, we could recommend an application the so-called universal principle of the creation of a “new quality.” This principle could be applied in various situations of social and economic life; it is suitable when examining both the processes of the development of the contemporary society and economy and the common processes typical to the various regional and global spaces (Melnikas 2002; 2011; 2013; 2014).

The universal principle of the creation of a “new quality” reflects the fundamental ideas of synergetics and of the processes of searching for and using synergetic effects.

The universal principle of the creation of a “new quality” could be defined as follows: a new quality always develops through amalgamation, when elements of different origin that never had belonged to the same system collide. This principle expresses the idea of developing and using synergetic effects, and it demonstrates that qualitative transformations always require actions and means necessary for joining elements of different origin into a common system.

When applying the universal principle of the creation of “new quality,” it is important to consider the fact that as a subsequence of amalgamation, there is always a new quality that is being created. At the same time, it is worthwhile to mention that the processes of amalgamation can be very different and, in the most common case, can represent two types: processes of *integration* and processes of *synthesis* (Melnikas 2011; 2013; 2014).

Processes of integration usually prove that in the course of amalgamation, elements that collide never lose their major primordial features: this means that the result of the integration marking the new quality can be disintegrated according to the previous features of the amalgamated elements.

The processes of *synthesis* demonstrate that elements colliding in the course of an amalgamation miss their major primordial features; this means that that the result of the synthesis possessing new quality cannot be disintegrated according to the previous features of the collided elements. We may state that qualitative changes within the synthesis are never recurrent, whereas qualitative changes within the integration may recur in some cases.

The processes of integration and synthesis, as a whole, could be defined as a basis for the creation of a “new quality”: whereas the processes of the scientific and technological progress are always focused on the search and use of synergy, as well as on the creation of a “new quality,” it can be argued that these processes could by their nature be called as the processes of integration and synthesis.

In turn, the processes of integration and synthesis, as processes reflecting the search and use of synergy and synergetic effects, could be defined as being greatly diverse,

which is determined by many different possibilities for obtaining and using various synergies and synergetic effects:

1. A diversity and variety of different areas and fields of the sciences, of the sectors of social and economic life as well as of scientific and technological progress and innovation activities;
2. A diversity and variety of the forms of scientific activities, academic studies, businesses, public and other activities that are involved into the processes of innovations and scientific and technological progress;
3. A diversity and variety of different cultures, systems of traditions, values, mentalities and lifestyles occurring in the environment of the social and economic life and activities, of the scientific and technological progress as well as a diversity of the societal groups that are involved into the processes of innovations and scientific and technological progress;
4. A diversity and variety of different experiences that are accumulated in various areas and fields of scientific cognition, scientific research, scientific and technological progress, academic and practical activities;
5. A diversity and variety of different individuals, of formal and informal organizations, of other participants of the processes of scientific cognition, scientific and technological progress, academic and other activities.

It goes without saying that the described cases of diversity and variety reflect many options and possibilities for realizing various ideas of the search and use of synergy and synergetic effects, including the implementation of various combinations of integration and synthesis of different factors, assumptions and circumstances: a rational combination of the processes of integration and synthesis of different factors, assumptions and circumstances characterizes the abilities for not only searching, acquiring and utilizing many synergies and synergetic effects but also for creating “a new quality.”

The described cases of the diversity and variety show enormous potential for initiating, implementing and activating a wide range of synergies and synergetic effects, at the same time – for initiating and implementing various innovations and promoting scientific and technological progress in general.

A summary of the presented statements allows us to conclude that the practical implementation and the use of the ideas of synergy and synergetic effects, integration and synthesis, as well as a wide realization of the universal principle of the creation of a “new quality,” creates many preconditions and opportunities for promoting and activating scientific and technological progress and innovations. At the same time, it can be said that the problems of the practical implementation and use of these ideas, as well as many questions of realization of the universal principle of the creation of a “new quality,” should be defined as an important priority of the scientific research on the processes

of scientific and technological progress and innovations, especially in the context of the contemporary needs of scientific research on knowledge economics in general.

3. Networking: The Needs, Perspectives and Priorities of Scientific Research

The practical implementation and the use of the ideas of synergy and synergetic effects, integration and synthesis, as well as the wide realization of the universal principle of the creation of a “new quality” creates many preconditions and opportunities not only for promoting and activating the scientific and technological progress and innovations, but also to implement many essential *qualitative changes* in society and in its life in general, especially - many essential qualitative changes in the contemporary economy..

As is shown in previous scientific works, the so-called *networking* and *the networks based development processes* reflects a particularly strong orientation towards the priorities of the scientific and technological progress, of synergy and synergetic effects, of integration and synthesis, as well as towards the wide realization of the universal principle of the creation of a “new quality” (Melnikas 2011; 2013; 2014; 2017). It is necessary to emphasize that *the networking* and *the networks based development processes*, as a *dynamic action*, expresses not only the search, but also the use of *synergetic effects*. It is obvious that the networks and networking are always making *various additional preconditions and opportunities* for the search and use of *synergetic effects*.

An orientation toward the search and use of synergetic effects explains the importance of the creation and development of the so-called networking society and networks-based economy, especially in the context of the contemporary needs of innovation activities, the acceleration of scientific and technological progress as well as of the innovative changes in all spheres of societal and economic life in general.

It is widely known that the concepts of networks and networking may be perceived from various perspectives, which could allow us to outline the possibilities and prospects of various forms of cooperation between the business and public sectors as well as the interaction between these sectors in various networks (Melnikas 2011; 2013; 2014). It is considered that the *networks* of business and public sectors include individuals, enterprises, institutions and other organizations and their groups, as well as various *structures* representing state and international organizations, whose activities may be performed in national and international spaces. Thus, it may be argued that the effects of networking on the interaction between business and public sectors, their convergence and integration, as well as internationalization, have various forms, potentialities and perspectives and are very important for these processes. This, in turn, allows us to state that *networking* is particularly important for analyzing the interaction between business and public sectors and their convergence as well as the changes in the interaction between various

states and international businesses and, in general, the processes of their convergence, integration and internationalization.

In fact, under the conditions of modern social, cultural and economic development, the advance of science and technology and, particularly, globalization and the internationalization of social, cultural and economic development, *networks* may be considered to be an effective and highly promising *organizational form*, for modern networks, as an organizational form, are strongly oriented toward innovations. Thus, the creation and development of networks is closely associated with the concept of searching for, identifying and applying synergetic effects, reflecting an orientation toward innovations.

As shown in previous scientific works, to consider a network as an organizational form, its concept should be defined first (Melnikas 2011; 2013; 2014; 2017). Generally, a network is considered to be a system of particular elements oriented toward achieving a common goal of performing common functions. This approach to the concept of the network allows us to identify the three main features of a network as a specific system:

1. A network is a system because its elements are connected, interrelated and may operate as a unit;
2. A network is a system oriented toward achieving a common goal or performing common functions, which operates as a single control and self-regulating unit;
3. The elements forming a network retain their original properties and features as well as a specific character. The latter allows us to identify a network as a specific system the elements of which are, to some extent, independent in performing their functions.

When a network is created or operates as a system of social character or nature, it may have a broader definition, which is the following: a network is an association of subjects, having specific interests and forming a system. This system is characterized by the following features:

1. The subjects of a system interact with each other;
2. In a system, common interests are realized, common goals are pursued, and general functions are performed;
3. A system operates as an organization with control and self-regulated functions.

A network is usually defined as an organization because it possesses the features of an organization. An organization is considered to be an association or a system of subjects, having two main features:

1. The interaction between the subjects of a system manifests itself as direct interrelation and feedback and based on the respective infrastructure;
2. In the structures of the special interests of any subject, common interests of the particular system's subjects become apparent.

A network as an organization has some specific features, too:

1. The subjects of a network demonstrate independence and autonomy as well as the capacity to retain their original features and characteristics;
2. A network, as a single whole, functions based on the principle of self-regulation.

The considered approach to the concept of networks, operating within the systems of social nature or character, allows us to interpret a network as a particular organizational form of various subjects' activities. It is also clear that the main advantage of each network is its orientation to innovations: a network, as a single whole and a system of various subjects, has potential for making use of various synergetic effects. Therefore, in an effectively operating network, the conditions for developing, spreading and applying innovations are created.

Taking into account the challenges of globalization and social, cultural and economic internationalization, it may be argued that the most successful and effective networks are those operating and spreading in international spaces, because in this environment, more favorable conditions for spreading innovations may be created. For this reason, the problems of network creation and expansion of the area of their application are considered to have priority status in developing and enhancing international management.

It should be noted that the problems associated with the creation of networks as well as enhancing their performance and expansion of their application area are rather complicated. This is accounted for by the existence of various types of networks: networks may be identified and classified based on a number of various features, which means that the various processes of network creation and the enhancing of their performance are very complicated. The study of various networks and their characteristic features is the main precondition for the successful development and use of effectively performing networks.

The main characteristics used for describing and classifying various networks as well as for identifying the problems associated with their creation, enhancement and expansion of application area are the following:

1. The characteristics describing the nature of network operation, its intended application and development;
2. The characteristics describing the subjects involved in network operation, as well as its influence on social, economic, political development and the advance of science and technology;
3. The characteristics describing the scope and expansion of network operation as well as its influence on social, economic, political development and the advance of science and technology.

The above characteristics describing the nature and purpose of network operation and development allow not only to get better acquainted with various types of networks,

but also to see the possibilities of using innovations in their operation and development.

An understanding of the essence and importance of the variety of networks and networking makes it possible to identify the most important definitions, as well as various phenomena, problems and development tendencies of the creation and development of the so-called networking society and networks-based economy.

The concepts and main definitions of the networking society and networks-based economy, as well as the concepts of the networking society and networks-based economy creation processes could be defined as very multiple. These concepts should be based on a range of scientific researches aimed at the knowledge-based society, knowledge economy, innovations, scientific and technological progress as well as at the various contemporary processes of globalization, internationalization of economy and European integration (David, Foray 2002; Goeransson, Soederberg 2005; Grace, Butler 2005; Steinmueller 2002). In addition, these concepts should be based on previous scientific works on networking and networks-based economies and social, economic and technological developments (Melnikas 2011; 2013; 2014; 2017).

It is obvious that the concepts and definitions of the networking society and its creation and of the creation of a networks-based economy may be defined and described differently.

In order to substantiate the appropriate definitions and descriptions, it is necessary to regard the following:

1. When describing a certain society, underlying attention must be paid to the highlighting of the most important values, typical of the society itself;
2. When describing a certain economy, underlying attention must be paid to the highlighting of the most important factors of the economy's growth.

Regarding the abovementioned attitude, it is possible to claim that it is purposeful to describe the concepts of the networking society and its creation and of the networks-based economy and its creation in the following terms:

1. The networking society is a society characterized by the values of the predominance of creativity and creative activity as well as those values that express the networking and synergetic effects based on the networks. In a networking society, the underlying interests express the objectives to create, spread and use new products of art, technology, business and other creation, as well as to use and create various networks for initiating, generating and implementing multiple creative ideas and innovations in all areas of life;
2. The networks-based economy is an economy for which the underlying growth factor is the potential, intended for the creation of various networks, for the generation, spread and use of the new knowledge as well as the activation of creativity. The raising and possession of the abilities for creating and using various

networks, the creation, spreading and use new knowledge, ideas and innovations in all areas of life, as well as the incessant raise of the economic efficiency with the acceleration and activation means of the science and technological progress, are the underlying conditions for economic growth and modernization in a networks-based economy.

The provided descriptions of the concepts reflect the main orientations of values, which express the objectives of creativity, creation activation, cooperation and partnership, new knowledge and products generation – typical for a networking society – as well as the main features that characterize the significance of the creation and use of networks, various cooperations and partnership activations of the new products and knowledge generation, innovation and science and technological progress – typical for a networks-based economy.

In order to describe the society and economy reasonably, it is necessary to regard the fact that there are internal contradictions that appear in every society and in every economy system, and which operate the same as the propulsion stimulating the progress of the society and the economy as well as the cause that determines certain destructive processes that can “destroy” or destabilize both the society and the economy. The highlighting of the underlying values, which are typical of the networking society and which express the domination of creative activity, the generation, spread and use of new products and knowledge, allows us to realize that the essential internal contradiction of the networking society is the contradiction among the society members, groups, layers and variously identified subjects (Melnikas 2013; 2014; 2017). The internal contradictions, typical for the networking society, influence the processes of the creation and development of a networks-based economy.

It should be noted that the definition of a networking society can be understood as representing a priority form of a knowledge-based society. By analogy, it can be argued that the definition of a networks-based economy can be understood as representing a priority form of knowledge economy. The validity of these claims can be explained by the fact that networking and the networks-based systems can be identified as an extremely important precondition for the creation, dissemination and the use of new knowledge.

Based on the presented statements, a general conclusion may be made that the transformation of the traditional societal and economic system into the networking society and networks-based economy is considered to be a significant factor of increasing the potential of the creation and spread of innovations, as well as of the activation and acceleration of scientific and technological progress. It is clear that new possibilities of purposefully increasing and effectively using the potential for the creation of innovations and the activation and acceleration of the scientific and technological progress may be found by using modern networks, international networks especially, and many other networking tools.

It goes without saying that scientific research on the networking society and the creation and development processes of a networks-based economy and problems should be seen as a priority area of the scientific research on modern economics in general as well as on the social, economic and technological development under contemporary conditions of globalization and European integration.

Conclusions and Recommendations

The modern *science of economics* includes many areas and directions. *The knowledge economic*, as an especially important and promising scientific area, should be mentioned among these areas and directions.

The knowledge economics is rather new area and direction of scientific cognition and research and academic studies; it is recently perceived as an essential part of the traditional science of economics and as a viable and prospective field of fundamental and applied scientific research of the economic profile.

The concept and definition of the knowledge economics can be defined and described as expressing and representing the scientific and practical activities oriented to the knowledge about the structures and changes of various economic systems and objects of economic activities, about the trends and structures of the processes of economic development as well as to the processes of exploring, designing or creating and developing new structures in the various fields and systems of economic life.

The essence of knowledge economics, as of a science, reflects the orientation to the dynamism of economic activities and the qualitative changes in economic life, in particular the activities and changes based on the generation, dissemination and use of new scientific knowledge.

Innovation activities and the processes of the scientific and technological progress always are at the core of the dynamics of economic systems and of the changes in economic life in general. Therefore, scientific and technological progress and innovation activities must be a priority in academic studies and in the scientific research on knowledge economics.

Scientific research on innovation activities and on the processes of scientific and technological progress should be oriented toward solving the most important social, economic, technological, ecological and other problems of the contemporary society.

Innovation activities and the processes of scientific and technological progress should be based on the so-called principle of the creation of “a new quality.” This principle expresses orientations for searching, locating and using synergy and synergetic effects, and it also provides for the two types of interconnection processes – integration and synthesis.

The implementation of the principle of the creation of “a new quality” allows for a targeted activation and acceleration of innovations as well as for the processes of scientific and technological progress.

The creation and further development of the so-called *networking society* and a *networks-based economy* can be defined as an especially important priority of the scientific and technological progress; also, it can be considered as a very important case of the implementation of the principle of creating “a new quality.”

In turn, the creation and further development of the networking society and a networks-based economy can be perceived as one of the cases and forms of the creation and development of a knowledge-based society and knowledge economy.

Obviously, scientific investigation, academic studies and scientific research on innovations, scientific and technological progress, as well as on the problems and processes of networking and a networks-based economy, could be defined as especially important priorities of scientific research on knowledge economics.

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