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THE STUDY OF FORMATION CHARACTERISTICS AND DEVELOPMENT TENDENCIES OF INTERNATIONAL INFORMATION AND KNOWLEDGE ECONOMY

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ABSTRACT

In this article the characteristics and formation stages of worldwide economical systems are explained. Differences of forming of information, industry and knowledge economy categories are given; approaches to its essence and content are analyzed. Characteristics of information and knowledge, their transformation methods and management systems are investigated. On the base of the analysis of development tendencies and formation characteristics of information and knowledge economy, proper recommendations are given.

1. INTRODUCTION

Formation of knowledge-based effective economy and enabling the transition to the stage characterized by the advantage of innovations, at the same time, the implementation of improving of economy structure deliberately is one of the priorities of the economy of Azerbaijan [1, 2]. The development of national economy, its position in global world economy system directly depends on the structure of social production. In addition, as everywhere, there are factors that are regional according to their origin and sphere of influence. Consideration of these factors is important in management of different fields of public life. Although the factor of exporting of natural resources is the main leading force of economic growth in the country, the main task at the current stage is firstly to eliminate the existing dependence on the export of oil-gas resources in economy. In order to prevent the risk of becoming a raw material exporter in the world economic system itis a necessary task to achieve the rapid growth of the non-oil sector in the republic, to increase the efficiency and competitiveness of economy and to provide its innovation-based progress [3, 4]. That is why in order to achieve effective structuring of the newly formed economy its complex comparative analysis is important. Also, as a result of determination of international economic development directions there is a need of development of scientific-methodological and information basis of creating an indicator system for measuring economic development, proper monitoring. Although some steps are taken in this direction in the field of research of similar problems in economic and academic organizations, a lot of problems that are necessary to work on still exist. In this direction, giving proper recommendations and suggestions for the economy

of the country nowadays by structure analysis of worldwide information and knowledge economy is one of actual problems.

2. WORLDWIDE ECONOMIC SYSTEMS, THEIR CHARACTERISTICS AND FORMATION STAGES

Every country is being characterized by its own economic system, i.e. organizing and managing the main problem of economy, the level of using the existing limited resources, also satisfying the needs of community and its members, different economic conditions and factors.

Economic system can also be viewed as a multitude of mechanisms and institutions related to making and realizing decisions about production, income and consumption in the boundary of a certain geographic area (P.Gregory, R.Stewart). Certainly, economic systems can be characterized by different criteria: 1) subject forming criteria – structure elements forming the subject of economic theory, 2)socio-economic criteria – criteria based on separation of the main content parties, 3)volume and dynamic criteria – criteria characterizing complexity and changeability of the system.

Economic system has market, administrative, mixed, planned and traditional types [5, 6]. Market economic system is an economic system based on commodity-money relations and private property, regulated by the laws of the market and the market mechanism, dominated by free competition and free choice of producers and consumers. As traditional economic system organizes production on the basis of traditions, it is the system that uses the same methods and means for a long time during the production. In the mixed economic system private and public sectors of economy operate simultaneously. In this economic system in addition to the market mechanism, also operates the mechanism of state regulation. At the same time, the market mechanism and the plan mechanism is also used. In the mixed economic system social direction of the economy is strong. Planned economic system is based on public property, centrally planned economy management on the means of production and other economic resources. In the planned economic system socio-economic plans of the country are prepared and delivered to the locations and businesses to be carried out. The resources for implementation of plan tasks are distributed in accordance with the instructions. Produced items are delivered to consumers as planned. Central control over the implementation of the plans is carried out.

The main driving forces and elements of economic systems are different. Accordingly, economic requirements and responsibilities of the society also change. As a result the unique economic characteristics of different periods are formed. Some features of the agricultural economy that have been inherent in most countries in the past, also appear in the other economic systems.

Table-1. Distinctive characteristics of information and industrial economy categories

№	Categories	Industrial economy	İnformation economy
1	Product	Financial	Information
2	Labour	Simple	Creative
3	Capital	Physical	Human
4	Wealth	External	Internal
5	Value	Labour costs	Creation time
6	Requirement	Numerous	One
7	Welfare	Economic	Creative
8	Money	Aim	Mean
9	Interaction	Commodity	Interpersonal
10	Human	Economic	Creative

Source: authors

Agricultural economy also as a science studies forms of creation of economic laws, the effect of their mechanisms for the development of agriculture, as well as economic laws agricultural production activity. As for the

characteristics of the industrial economy it should be noted that it is an economic theory of industrial society. Industrial economy also can be considered as traditional economy. Some categories of industrial economy and information economy replacing it in further development stage have distinctive characteristics (table 1).

3. THE FIRST STAGE OF THE FORMATION OF INFORMATION ECONOMY

Analysis of the economic characteristics of the post-industrial era shows that this era can be called information economy era as well. Information economy is comparatively newly formed term. Those close to the meaning are definitions like "post" and "neo-industrial society", "knowledge economy", "new economy" and so on. In recent years "new economy" which is used in scientific literature, is also used as a synonym of development stage of post-industrial economy. Different researchers attempted to explore different aspects of this stage of economy [7, 8].

Science, education etc. is of great importance in post-industrial society. Science, being a productive force and how the value of intangible assets affects the price of the product and other issues like this are of great interest. Post-industrial society is a society where preference has passed from commodity production to service production, doing research, the organization of the education system, improvisation of the quality of life and so on. In this society the class of technical specialists has turned into the main professional group and the application of innovation here has become more dependent on achievements of theoretical knowledge. Post-industrial society implies creation of such a new class that its representatives act as consultants, experts or technocrats. The main economic characteristic of post-industrial structure is formation of a society based on information and service production. This implies a decline in the number of regular employees and an increase in the share of high-skilled workers. In future this process the process taking place in the structure of employment of population will also change the class structure of society.

There are many fields of "new economy" relating to different spheres of activity. Its characteristic features are: more investment contribution of intellectual human capital in comparison with the material elements; high specification and uniqueness of intangible assets; relatively much innovation composition in the activities of companies; the pace of innovation of production on average is higher than in real economy; updating of production technologies or products and services is continuous.

"New economy" as a term is accepted as a synonym of post-industrial stage of development. "New economy" has the following distinctive characteristics:

- Relative cheapness of material goods in comparison with intellectual goods.
- Globalization of the markets. In the past in the competition struggle geographical factor was one of the determining factors. Now this factor doesn't exist, but at the same time the number of competitors in the various continents, thousands of miles away is growing.
- Instant reaction of the market. Real-time interaction of market-oriented subjects changes not only informativeness degree of economy but also its essence.
- Human factor. "New economy" transforms human thought, structure into the main leading factor.
- Instant increase effect. In the conditions of "new economy" goods and services enter the market in a moment.
- Information mediation. In traditional economy mediators have already started to disappear. Because a large number of methods has occurred for customers and sellers to find each other. In "new economy" the role of mediation begins to increase again. But this happens in informatics, not in commodity aspect.
- Virtualization of market. "New economy" actually destroys physical barriers caused by traditional economy.
- Personalization. Communication is mostly established with the "face-to-face" principle.
- Co-ordination of the market phases. In the "new economy" conditions advertisement, marketing, customer search, order compiling, the stages of its payment and "transaction" itself mostly co-ordinates with one another.

The following also can be related to distinctive characteristics of post-industrial economy:

- Time plays an important role as a new factor in competitiveness. So that competitive advantage directly depends on the speed of receiving and sharing information.
- The formation process of transnational corporations contributing to the globalization of economy accelerates.
- The negative characteristics of industrial economy, especially its destructive impact on nature began to emerge more sharply.
- Information factor was added to capital, labour, land factors which created a system in political economy in the past.
- The role and place of the human factor in production began to change radically.
- Automatization of industry sharply reduced the amount of physical labour and led people from production straight to its management sphere.
- The process of transformation of the role of property into the means of production started. Private property began to lose its significance in production processes. Associated forms of property: joint, corporate, associate, mixed came instead of it.
- The ownership of non-material, as well as foreign assets became a major source of capital. These rights can be in the form of licenses, patents, corporate or securities.
- Intellectualization of labour required transformation of social organization of production, the priority of employee's identity. Forced labour belonging to the epoch of classic capitalism is not economically advantageous.
- Due to changes in the volume of sphere of production and services, information and intellectual labour sector the transformation process of the structure of economy began.
- Due to innovative technologies there was a displacement of priorities for the benefit of consumption in "production- consumption" system.

Regarding to improvement of ICT, active use of innovative technologies in industry, globalization of market and so on, "new economy" is a stage of development of post-industrial economy. That is why these concepts have almost the same content, meaning and are synonyms. Comparison of the characteristics of "new economy" and post-industrial economy as a result allows assessing similar and different characteristics of these concepts and coming to a conclusion like this: "New economy" can be viewed as a development model of economy of the initial stage of post-industrial society.

4. THE APPROACHES TO THE ESSENCE OF INFORMATION AND KNOWLEDGE ECONOMY

The successful formation of the information society first of all depends on formation and development of new economy based on information and knowledge, modern technologies and innovations, and also information economy [8]. Information economy – is economy where a big part of gross domestic product (GDP) is provided in production, processing, maintaining and distribution spheres of information and knowledge and more than half of the able-bodied employees participate in this activity. The term information economy was first put into scientific circulation by American scientist M.Porat in the mid-1970s. According to his opinion information technologies reflect the main content of new society. Information and knowledge acts as main production resources and forms of public wealth. Since the 90s of the XX century the terms "knowledge economy" or "knowledge-based economy" began to spread widely in science. Distinctive characteristics of information economy are mainly the following:

- The fact of information and knowledge being a production factor and main resource;
- Wide use of information technologies in production and non-production fields;
- The loss of materiality of the created product;
- Change of character and structure of labour;

- Global nature of new economy and so on.

The approaches to the essence and content of information and knowledge economy includes: 1) F.Machlup's approach (1962, knowledge production field), 2) The movement started in 1996 (methodological article of Socio-Economic Development Organization of United Nations Organization), 3) Approach of limited and unlimited resources (the application and effective use of resources), 4) Approach of human capital (natural capital – 10%, human capital – 70%), 5) Approaches learning the main aspects of economy in a complex (World Bank, ICF, SEDO indicators), 6) Approaches based on separate main parameters of economy (innovation, human capital, competition, sustainability, quality of life, social development), 7) Different socio-economic views and opinions (literacy, longevity, human development, …)

5. CHARACTERISTICS, TRANSFORMATION METHODS AND MANAGEMENT SYSTEMS OF INFORMATION AND KNOWLEDGE

Nowadays information and knowledge resources also act as traditional production factors. They have also become a leading factor of production as a resource of great importance. As a strategic resource information and knowledge is the basis of the source of social welfare. Information and knowledge have kinds and types like obvious and non-obvious knowledge, scientific-welfare, religious, logical, intellectual, practical, intuitive knowledge. Information and knowledge have different structure and classification. Besides industrial, agricultural, service spheres of economy, information sector first was separated as a free sphere by American scientist F.Machlup and was investigated in his works comprehensively. In order to evaluate the amount of information production in gross national product he differentiated 5 groups combining 30 spheres inside: 1) education; 2) scientific researches and developments; 3) media and communication; 4) information machinery and equipments; 5) information services. The role of information in modern economy was specified and analyzed by F.Machlup. He also differentiated the professional group associated with the creation and processing of information.

The distinctive features of information resources lead to an increase in labour productivity and efficiency. Information and knowledge gains strategic resource status in information society. And ICT is the main use tool of information and knowledge resources. Thus, information and knowledge in information economy not only impacts on increase of efficiency of traditional production factors, but also acts as an independent production factor. At the same time, unlike the traditional production factors, information and knowledge resources allow to prevent economic disasters and crashes and to provide durable economic development [9, 10].

According to "International Data Corporation" analytics' forecast, in the coming years the volume of global information technologies market will increase for 12,5%. In 2016 sales volume of IT production and services becomes close to 2,4 trillion dollars and in 2020 this index will be 2,7 trillion dollars. Thus, experts assess the average annual growth rate of IT market as 3,3%. In large areas like financial services and production sector IT expenses are predicted to grow rapidly.

According to the experts' evaluation, the volume of expenses in the telecommunications sector will gradually grow in comparison with previous years. In the coming years 33% of sales volume of IT solutions will account for banking and telecommunications sector. In 2015, 25% of global IT expenses accounted for consumption trade. But users spend less money on buying computer, tablet and mobile phone, so this will impact on information technologies sphere. Further increase in global tablet market will mostly depend on corporate sector. IT expenses are expected to increase in health sector too. For example, in 2015- 2020 on average 5,7% increase is expected in this sector.

The required basic skills in the management of information are search, analysis, structuring, storage and manipulation. Refers to the work related to information: receipt and collection of raw data; communications, transfer of information from one source to another; processing and changing of information from one form to another; storage of processed information; access to protected information, search; access, forming of information in

a convenient way for the user. Information and knowledge can also be viewed in such way: information=data+metadata; Knowledge=information+metainformation.

Knowledge which has stages like identification, acquisition, beginnings has different management systems. According to European Concept, management is implemented in 5 stages: detection, formation, storage, distribution, use.

6. FORMATION CHARACTERISTICS AND DEVELOPMENT TENDENCIES OF INFORMATION AND KNOWLEDGE ECONOMY

Analysis process firstly requires paying attention to functional parts of economy such as production, social, business, information, intellectual, political, territorial and others. It is known that main elements of information and knowledge economy include education, science, human capital, venture funds and business, knowledge and high technology production, information and knowledge society, creation and transfer of innovations, government, and citizen and business institutes [2, 11]. That is why besides considering specific characteristics of information and knowledge economy, attention should be paid to principal differences of IKE from traditional economy (scientific contribution, intellectual products, globalization, ICT, STP tempo).

Basic components of IKE include 1)highly qualified workforce, 2)National Innovation System, 3)Information Infrastructure, 4)Institutional and efficient economic conditions. 3 main spheres form the core of IKE: Science and innovation, ICT and education.

The main activity spheres of information and knowledge economy are following [12-14]: pharmaceutics and biotechnology, Medical industry, Software and digital content, IT-service, Telecommunications, Computing and e-industry, Creative content and digital media, Aerospace and aviation industry, Transport and technical service, Management services and high technologies.

Sectoral classification of information and knowledge economy is as various as classification of science- and knowledge-intensive sectors: Management services sector, Knowledge production sector, ICT production sector, Cultural services and information sharing sector, Social services sector. This includes creative economy sectors. Great Britain which is considered leader country in this sector related following sectors particularly to creative economy: advertisement, architecture, handicrafts, cinematography, design, music, clothing models, fun games, performing arts, media, TV and radio, software and computer systems. Science-intensive sectors include: microelectronics, computer equipment, robot-building, information industry, atomic and aerospace production, organic synthesis chemistry, microbiological industry, water and air transport, communication, education, financial activities, health and public and social services, scientific research, experimental constructive works.

Standard of International Trade Classification (SİTC) has stated 16 science-intensive products (radioactive materials, pharmaceutical goods, AMS equipments, semiconductor devices etc.) and 41 high-level technology fields. Besides, according to OECD the productions having the same indicator more than 3,5% are related to science intensive production.

The development tendencies of information economy form depending on both concrete country and the factors playing role in forming of information economy and state regulation and programs of economy (table 2).

Table-2. Development tendencies of information economy

Countries	Main factors of the formation	State regulation and programs
USA	Development of national innovation system, high productivity of labour, science-intensive production and development of service areas, scientific-technical development, investments and capital opportunities.	Science and innovations, education, development of ICT, financial support to human resources and R&D, tax incentives, antimonopoly policy and so on.
China	Export of high-technology products, high education potential, high level of specialized staff, development of science-intensive spheres	Investments to human resources and R&D, government plans for the development of the computer industry
S. Korea	Export of high-technology products, high education potential, high level of specialized staff, development of science-intensive spheres	Investments to human resources and R&D, government plans for the development of the computer industry
India	outsourcing, specialization in the field of offshore programming, development of the service area, export of high-technology products, high education potential, high level of specialized staff, development of science-intensive spheres	Investments to human resources and R&D, government plans for the development of the computer industry
Japan	high education potential, high level of ICT infrastructure, high level of life high living conditions of the population, high development of the industry	Government program for investments to high output capable networks, R&D, internet use in government institutions, development of staff qualification and so on.
Israel	Development of high-technology sector, export of high-technology products, specialized workforce, technological infrastructure	Government program for development of IT products, state support for IT industry, government program for education sphere, investment to R&D

Source: Compiled by the author on the basis of Dubynina and Malakhov [11]

7.CONCLUSION

Nowadays, positive structural changes ongoing in the economy of developed countries show themselves in the increase of the importance of non-material production resources such as science, knowledge, information. In the first decade of XXI, ICT developing and spreading rapidly, expanded process of globalization seriously affected the socio-economic life of Azerbaijan, like of other countries. The factors of global character influence processes taking place all spheres of life. Different concrete issues formulated in the direction of strengthening of interaction between the development concept of the country and fields of science, education and production on strategic road maps. Main principles of state policy in the field of organization, management and development of scientific activity, aims of science and scientific innovation activity, the rights and responsibilities of subjects of scientific activities, mechanisms of financing of science, stimulation of scientific achievements and organizational and legal basis for their use are defined. In this direction transformation methods and management systems of information and knowledge, also relevant recommendations developed on the basis of analysis of formation characteristics and development tendencies of information and knowledge economy serves to the future of the development of the country.

Solution of the problems of forming of intellectual society and economy based on knowledge, effective organization of the activity of scientific innovation subjects – integrative science, education and business centres, funds, analytical information banks on innovations are the main directions of the mentioned development.

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