

Elaboration Development Strategy and the Analysis of Trends Shaping the Information Economy in Azerbaijan on the Basis of the Experience of Foreign Countries

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Abstract—In the paper, information on economic development trends in developed countries are analyzed. The current status of information society and economy of the country is reviewed and some recommendations are given for future development.

The problems of Information Society and establishment of its innovative economy are studied. In this turn, development trends information economy in developed countries are analyzed.

Keywords—Information economy, ICT sector, ICT infrastructure, innovation system hi-tech products, antimonopoly policy.

I. INTRODUCTION

RECENTLY, the developed countries have shifted to modern ICT technologies, a new type of information and knowledge-based economy rapidly. Transition to the new economy is characterized with the change of the nature of traditional production areas, and with the fact that information became a key production resource and a major development factor of the economic system. Despite the informatization and globalization of the economy, expanding application areas of ICT, and development of scientific-knowledge of similar spheres the development concept of the information economy is in initial phase. Depending on the development characteristics of the countries there exist some definite differences and problems in the formation and the development of the economy. Therefore, the USA, the European Union countries, as well as developed countries such as Japan, and the developing countries such as China, India, South Korea and etc. study current development trends of the formation of information society and economy and conduct researches for its successful implementation.

II. DIFFERENT CHARACTERISTICS OF INFORMATION ECONOMY

Global informatization of the society, the rapid development of information technology and the technical means, increased demand for a variety of information services,

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formation of national and global information and communication systems led to the emergence of new type of the economy as information economy. Information economy has a number of distinctive characteristics. One of them is that the production of information, products and services are science-intensive. Therefore, their quality, competitiveness in domestic and foreign markets significantly depend on the rate of technological development in this and other country, and primarily on the rate of development and use of modern information technologies. In its turn, it is determined by the development of knowledge, education and culture.

Formation of information economy is an important factor to accelerate the development of various economic sectors, such as industry, construction, transportation, and mining. It also provides the fields of science and education with new tools becoming their key development tool itself.

Information economy necessitates high mobility of production, its orientation toward new product types and its efficiency.

Many types of information products and technologies may be used for many purposes for its functional capabilities. They include a large number of computing and data transmission means, information technology of real-time management facilities, as well as modeling and prediction of complex systems and process traffic. Information economy provides knowledge generation and efficient use, which contribute to save raw materials, energy, material and human resources. Therefore, it is a key factor to overcome the global economic crisis, and to shift the humanity into sustainable and safe development phase [1].

The development of the information economy generates a new employment structure of the population, stimulates the development of new types of individual labor and creativity, creates and distributes new types of products and services, changes welfare of the people radically, and creates new opportunities for the development of an individual, and for the emergence of new information culture and moral values of the society.

Information economy has specific information and knowledge resources, which combines the typical characteristics such as to be replicated, distributed and used as a commodity.

The U.S., Israel, South Korea, China and other countries have achieved significant success in formation of Information

economy, primarily in the field of informatization of the national economy.

III. THE U.S. STATE REGULATION OF INFORMATION ECONOMY

The U.S. is a leader in the field of formation of information economy. The U.S. developed comprehensive, multilevel system of national innovation in this area, which can be even regarded as the world standard. The U.S. carried out its implementations in the fields of science and innovation, education, the development of ICT, risk financing, the development of the information economy, which meets requirements of the legal framework, as well as a variety of related activities [2].

At the end of the XXI century, the U.S. designed the following mechanisms in the implementation of state regulation of the information economy to increase competitiveness of economy, science and technology in global market: tax policy; state programs on R&D financing in the field of information production, as well as programs supporting the development of education sector and entrepreneurship; antimonopoly policy; state policy in the field of employment.

American state tax policy is targeted at stimulating investment to the information economy, as well as it is focused on creating favorable conditions for labor activity of experts in the field of information. Due to the tax regulation mechanisms of American tax policy, the U.S. investment in informatics tools increased by 4 times each decade, and the labor productivity averagely by 2.1%.

28% of all research and experimental-design work in the U.S. (R&D) are conducted with financial support of the state. Significant role of the state in the formation of information market is associated with a high capital-intensive of the whole software and innovation activity.

The state support for newly established enterprises includes reducing state barriers, ensuring their access to credit resources, preferential tax for small and medium businesses. First of all, American experience in the information and telecommunication industry should be especially noted in the field of antitrust regulation. Investment of billions of dollars in R&D sphere is strongly influenced by the state monopoly policy [3].

According to the scale of costs of R&D, logistics and human resources in recent decades, United States left behind all other countries. In 2011, the total costs incurred by the US to R&D amounted \$ 499 billion (3.7% of GDP). This amounts approximately 42% of total cost of research and development of Organization for Economic Cooperation and Development (OECD, OECD) member countries.

Scientific and technical potential of the U.S. is concentrated higher in some states - California, Michigan, Massachusetts, Pennsylvania.

IV. DEVELOPMENT PROGRAMS FOR TECHNOLOGICAL INNOVATIONS IN ISRAEL

Israel pays a great attention to the development of high technology. Breakthrough in the field of high-tech in the country was due to the massive import of "human capital".

The Israeli government adopted a package of new programs to promote technological innovation. Under the programs, the government-owned insurance company provided investment funds at risk with investment guarantees up to 70% of their initial capital.

The program created favorable opportunities for successful transformation of high-tech sector of Israel. Realization of the above-mentioned programs led to the diversification of high-tech products' export of Israel [4], [11]. The share of high-tech products in total exports increased to some extent. An impact on the world high-tech products market is the characteristic of the Israeli economy [6].

V. ELECTRONIC JAPANESE STATE PROGRAM

Japan Basic Law on the information society came into force in January 2001. According to this law, the state program "e-Japan", which provided conversion of the country into the world's leading information state, was implemented. The priorities of the state program "e-Japan" are as follows: computer literacy of the general population; availability of safe and efficient information exchange; establishment of an efficient information infrastructure basing on free and healthy competition in the telecommunication market; attracting the world's best experts in the field of information technology to Japan [3].

In early XXI century, international competitiveness of Japan is associated with the development of the Internet and overall economic liberalization. The new methods were adopted for GDP measurement, which benefits from software, new technology, services, healthcare, infrastructure and other advantages more precisely. The program particularly focused on investing funds in the creation of networks with high bandwidth applications, R&D, the use of the Internet at the state enterprises, training of more professional human resources, and etc.

VI. DEVELOPMENT STRATEGY TELECOMMUNICATION MARKET OF THE REPUBLIC KOREA

The Republic of Korea established its development strategy of telecommunication market for science and technology according to the "general innovation" program. The national innovation system was expected to be the most important factor for the development of national economy of the country. The information areas, such as production of special displays for digital information transmission, intelligent robots, digital contents and etc. have developed.

Success of South Korea in this field is due to the publicity of telecommunications market. Long-term development strategy of the telecommunications market is to provide high-speed Internet access. Antitrust policy of South Korea contributes to the development of video-information

transmission technologies via Internet. This, in its turn, contributes to the competitive advantages of South Korean manufacturers in the field of mobile devices provided with Internet access.

VII. DEVELOPMENT OF THE INTERNET IN PRC

In 2006, the share of the R&D expenses amounted 1.8% of GDP of People's Republic of China. 40% of investment to R&D was provided by the state, and 60 % by domestic and foreign private firms. In 2003, China rated 3rd country in the world for the amount allocated to research and experimental-design projects. According to this indicator Chinese lagged behind the U.S. and Japan. China distinguishes for its highly developed Internet, and it is supported and controlled by the state directly. Including the Internet, information technology, first of all, is developed to present China's export products to the world market [4].

Currently, the Chinese government supports distribution of Internet technologies in most advanced areas of industry, in order to improve the management quality and competitiveness efficiency. This will lead to the increase of the number of Internet users in China in coming years, and the development of Internet economy.

VIII. OFFSHORE PROGRAMMING IN INDIA

India has made significant progress in the development of the information economy. Approximately 4 million people in the country are engaged in the spheres of service, and 340 thousand in computer companies. IT industry of India is specialized in the field of outsourcing and offshore programming [5]. Offshore programming development is fully supported by the government; India increases its budget for training human resources, R&D and e-commerce to develop information economy. India is considered to be sufficiently serious competitor for Central and Eastern European countries specialized in the field of offshore programming, as well as Russia.

The analysis of development tendencies of various countries in the formation and development of information economy showed, that ICT infrastructure, national innovation system, the development of scientific and service industries, the export of high-tech products, higher potential of education, high-level specialized human resources, and etc. are the key factors in the formation and development of information economy (Table I).

IX. FORMATION OF INFORMATION ECONOMY IN AZERBAIJAN

At present, a new economy is being formed in Azerbaijan, which is based on information, knowledge, and modern technologies. The development information and communication technologies, and transition to Information society, expanded use of ICT and e-services at the state and local governmental bodies, meeting information the needs of society for information products and services, and the training of scientific human resources and other qualified

professionals, and etc. are of prior tasks of the Development Concept of the country by 2020.

TABLE I
DEVELOPMENT TRENDS OF INFORMATION ECONOMY IN VARIOUS COUNTRIES

№	Countries	The main factors that play significant role in formation of information economy	State regulations and programs of information economy
I	USA	Development of national innovation system, high labor productivity, development of knowledge-intensive production and service areas, scientific and technical development, investment and capital opportunities.	Science and innovation, education, development of ICT, financial support for human resources and R&D, tax incentives, antitrust policy, and so on.
II	China	Export of high-tech products, high potential of education, high level specialized human resources, development of knowledge-intensive industries	Investments in human resources and R&D, state plans for the development of computer industry
III	South Korea	Development of the national innovation system, export of high-tech products, high potential of education, high level of specialized human resources, development of knowledge-intensive industries	Investments in human resources and R&D, state plans for the development of computer industry
IV	India	Development of outsourcing, offshore programming services sectors, export of high-tech products, high potential of education, high level of qualified human resources, development of knowledge-intensive industries	Investments in human resources and R&D, state plans for the development of computer industry
V	Japan	High potential of education, high level of ICT infrastructure, high living standards of the population, high development of industry	Investment in the networks of high bandwidth capacity, R&D, the use of the Internet at the state enterprises, human resources
VI	Israel	Development of high-tech sector, export of hi-tech products, specialized labor force, technological infrastructure	State programs for the development of IT product and education, investments in IT-industry and R&D

Taking into account the characteristics of the country for current period, the national development model is adapted to analyzed development trends of advanced countries.

ICT sector in the country was declared a priority in recent years, and many large-scale projects are implemented in this regard. That is why, according to some development indicators, Azerbaijan left behind some leading countries.

"The Global Information Technology Report 2014", developed by the World Economic Forum, rated Azerbaijan 49th among 148 countries for its "Networked Readiness Index", which reflects the development of the countries in the field of information technology [10]. It maintains its leading position in the CIS, being rated 59th for the number of Internet users per 100 people out of 148 countries, and 46th for the number of broadband Internet subscribers. In addition, due to the innovative ability of the companies, Azerbaijan rated 35th in the world, and 1st among CIS.

Currently, there are about 1 million Internet users in Azerbaijan. 50% of which is broadband users.

Recently, ICT sector has become leading and dynamically developing area of the economy. Over the years, investment to the industry amounted approximately \$ 2.5 billion.

Mobile network has been expanded. 4G technology was introduced in the country since 2012. There are 110 mobile subscribers per 100 people in the country. Internet channel capacity increased by 12.9 times in last five years, and reached 200 Gbit/s, and the size of the Internet services market increased about 4 times [7].

On February 8, 2013, the first telecommunication satellite of the Republic of Azerbaijan "Azerspace-1" was launched on the orbit, which is the highest technical achievement of the country since its independence. Commercial exploitation of the satellite started, which is capable to provide Europe, Middle East, Central Asia and African countries with telecommunication, Internet, television and radio broadcasting services [9].

"Electronic-State" project is carried out in the country successfully; the use of electronic signatures is expanded. "E-state" portal (www.e-gov.az) was launched in order to provide information exchange among information systems of government agencies, and to ensure e- services through "single-window" principle. 179 electronic services submitted by 30 state agencies are available for the users. At the same time, service centers "ASAN Xidmat" (EASY service) are organized to provide comfortable and higher quality services to citizens from single location, with the use of modern innovations, which is highly appreciated by many international organizations and universities, and became the brand of Azerbaijan.

High-specialized human resources are trained in ICT to expand national capacity. State Fund for Development of Information Technology and "High-Tech Park" has been established in the country to provide developed and competitive innovative ICT industry with high export potential [8].

These new bodies will contribute to strengthening economy of the republic of Azerbaijan, attracting foreign investment and expanding ICT products, and so on.

X. CONCLUSION

The studies prove, that establishing efficient information infrastructure based on free and healthy competition of telecommunication market, the development of ICT sector, including the high-tech sector and the services, investing to R&D and high-tech institutions, expansion of the export of high-tech products, computer literacy of the population, availability of efficient and secure information exchange, training of human resources, the development of e-commerce, government support and the legal and regulatory framework are of great importance for the formation and development of information economy.

Current development rate of the country, taking into account its features, benefiting from the experience of the advanced countries, information society and economy can be certainly formed and developed in Azerbaijan.

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