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THE STRATEGY OF KNOWLEDGE-BASED ECONOMY CREATING IN THE CONTEXT OF FURTHER DEVELOPMENT OF KAZAKHSTAN

The paper examines the basic prerequisites for knowledge-based economy formation in Kazakhstan. The specific features of state strategy in transforming the Kazakh economy to meet the innovative development requirements are disclosed. Major strategic steps to be taken for more efficient transformation to knowledge-based economy are analysed; the main strategy building stages for Kazakhstan are proposed.

Keywords: economic development; knowledge-based economy; innovation strategy; Kazakhstan.

Дінара Нукетаєва, Алмагуль Канагатова, Жулдиз Сулейменова СТРАТЕГІЯ СТВОРЕННЯ ЕКОНОМІКИ ЗНАНЬ У КОНТЕКСТІ ПОДАЛЬШОГО РОЗВИТКУ КАЗАХСТАНУ

У статті досліджено основні передумови формування економіки знань у Республіці Казахстан. Розкрито особливості державної стратегії щодо трансформації казахстанської економіки з урахуванням потреб інноваційного розвитку. Проаналізовано основні стратегічні кроки, які мають бути здійснені для більш ефективної трансформації до економіки знань, також запропоновано основні етапи стратегії побудови даної економіки в Казахстані.

Ключові слова: економічний розвиток; економіка знань; інноваційна стратегія; Казахстан.

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В статье исследованы основные предпосылки формирования экономики знаний в Республике Казахстан. Раскрыты особенности государственной стратегии по трансформации казахстанской экономики с учетом требований инновационного развития. Проанализированы основные стратегические шаги, которые должны быть предприняты для более эффективной трансформации к экономике знаний, также предложены основные этапы стратегии построения данной экономики в Казахстане.

Ключевые слова: экономическое развитие; экономика знаний; инновационная стратегия; Казахстан.

Introduction. The recent world crisis shows us that some economic paradigms which worked well in the XIX–XXth centuries do not satisfy and cannot predict global socioeconomic changes at the beginning of the XXIst century.

Changes in technologies, Internet revolution, information spread only the tip of the iceberg, fundamental transformation is deeper, and a basis of such changes are innovations, which concern all sides of life. Thus, we need to understand not only such changes but explain and predict their future development.

This period is distinguished by sufficiently large value of material resources, as well as by significant increase of human resources, intellectual and human innovation

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role that creates a new form of intellectual capital, which became the main factor of current socioeconomic development.

Trying to understand this large-scale transformation, contemporary economists, philosophers and other scientists have created a number of different concepts that reveal the main aspects and principles of social development to determine future prospects.

This issue is crucial for Kazakhstan due to the fact that current macroeconomic situation is characterized by significant exhaustion of intensive development possibilities within the existing structure of the economy, increasing capital intensity of mineral production, lower parameters of return on investment projects in the high-tech sector, lack of facilities and new technologies etc.

The President of Kazakhstan reiterated the key development priorities for the country to become one of the top 30 developed countries by 2050. The new strategic vision "Kazakhstan-2050" sets joining the ranks of the top 30 developed countries by 2050 as an overarching goal for the country. The president emphasized that to achieve this goal Kazakhstan will have to transform itself to a *knowledge-based economy* that is open, fair and inclusive for all citizens and for innovative private sector development (Address by the President of the Republic of Kazakhstan, Leader of the Nation, N. Nazarbayev, 2012).

Latest research and publications analysis. Taking into account the multifacet problems of formation and development of knowledge-based economy, its relationship with various aspects of the economic system at the micro-, meso-, macroeconomic and international levels, single issues of this subject were studied by many domestic and foreign scholars who represented different schools and trends. Among them, we can distinguish such foreign authors as P. Drucker (1969), G. Dubyanskaya (2007), V. Inozemzev (1995), F. Machlup (1962), M. Porat (1977), N. Stehr (2002), V. Suprun (2006), A. Toffler et al. (1994) etc.

Although this topic is practically new for Kazakhstan, we can mention such domestic researchers as I. Abeysekera (2007), A. Kanagatova et al. (2013), A. Kireyeva (2013).

However, we need to note that the above studies do not analyze how to build a long-term strategy for knowledge-based economy formation, especially for such a transition economy as Kazakhstan.

The main goal of this article is to analyse the current governmental approaches in the field of knowledge-based economy creation and to introduce basic steps of the long-term strategy developed by the authors.

The structure of this article is as following: in the first part we are going to analyse theoretical basis of the knowledge-based economy formation (Kanagatova et al., 2012; Kulsariyeva et al., 2013), the second part offers an overview of the current government policy in the innovation sector of Kazakhstan and the last part of the paper will present steps for long-term strategy of transformation to knowledge based economy in the context of Kazakhstan development objectives and peculiarities.

Key research findings. It is not a new idea that knowledge plays an important role in the economy. Knowledge and information tend to be abundant; what is scarce is the capacity to use them in meaningful ways (OECD Report, 1996).

Society development has led to civilization transformations in general and economics in particular. During the economic evolution not only man production capacities has changed, but also the basis for these growth opportunities (Figure 1).

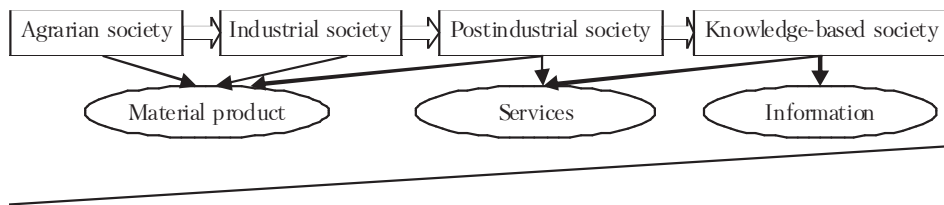


Figure 1. **Human production capabilities**, developed by the authors

The transition from agrarian society (based on agriculture and its products) to the industrial one occurred due to further division of labor, technological progress and the development of industrial production.

Further, the transition from industrial to postindustrial society can be characterized by the increase of various kinds of services. Subsequently, the growth of services related to the removal, processing, transmission and provision of information and the search of new knowledge through intellectual activity, led to the development of information society intensification. Today, we have a great variety of the "knowledge based society" definition (and titles). So, what do we understand under this term?

One of the first researchers who developed the concept of information society was the economist F. Machlup. In 1933 F. Machlup began studying the effect of patents on research. He distinguished 5 sectors of the knowledge sector: education, research and development, mass media, information technologies and information services. Based on this categorization he calculated that in 1959 29% percent of the GNP in the USA was produced in knowledge industries (Machlup, 1962: 29).

After F. Machlup there were a lot of scientists, who started investigations in the knowledge-based spheres. For instance, P. Drucker argued that there is a transition from an economy based on material goods to the one based on knowledge (Drucker, 1969: 12).

M. Porat distinguishes primary (information goods and services directly used in production, distribution or processing of information) and secondary sector (information services produced for internal consumption by government and non-information firms) of the information economy. M. Porat uses the total value added by the primary and secondary information sectors to the GNP as an indicator of information economy. The OECD has employed M. Porat's definition for calculating the share of information economy in the total economy. Based on such indicators information society has been defined as a society where more than half of the GNP is produced and more than half of the employees are active in the information economy (Porat, 1977: 103).

N. Stehr argues that in the knowledge society the majority of jobs involves working with knowledge. "Contemporary society may be described as a knowledge society based on the extensive penetration of all its spheres of life and institutions by scientific and technological knowledge" (Stehr, 2002: 18).

Also A. Toffler asserts that knowledge is the central resource in the economy: "In a Third Wave economy, the central resource – a single word broadly encompassing data, information, images, symbols, culture, ideology, and values – is actionable knowledge" (Toffler, 1994).

According to all the definitions mentioned above, we can make a conclusion that the key concepts of knowledge-based society and knowledge economy are the following:

1) knowledge-based society is characterized by the predominance of creativity and creative activity, as well as the values that express generation, spread and use of new knowledge. In knowledge-based society, the underlying interests express the objectives to create, spread and use new products of art, technical, business and other creation, as well as initiate, generate and implement multiple creative ideas and innovations in all the areas of life;

2) knowledge economy is the economy for which the underlying growth factor is the potential intended for generation, spread and use of new knowledge, as well as the activation of creativity. The raising and possession of abilities to create, disseminate and use new knowledge, ideas and innovations in all the areas of life, as well as the incessant rise of economic efficiency with the acceleration and activation of science and technological progress are the underlying conditions for economic growth and modernization in knowledge economy.

Creation and modernization of knowledge-based society and knowledge economy are very complicated processes oriented to the formation of a new-quality society and lifestyle. Moreover, these processes may be described as especially complicated because they are oriented to the pursuit of new quality in two aspects:

1) knowledge-based society and knowledge economy, compared to "traditional" society and economy, are in all cases described as qualitatively new;

2) creation and development of knowledge-based society and knowledge economy take place under the conditions of global changes, which means that qualitative changes take place in global space, the essence of those changes being creation and spread of knowledge-based society and knowledge economy.

Analyzing the economy of Kazakhstan, we need to underline that today, according to major market indicators, we are at the transformation stage between industrial and postindustrial economies. So we can make a conclusion that we lag behind the leading countries at least by 30 years (for example, in the US economy in 1991, investments in information technology for the first time exceeded the revenues of production technologies (112 and 107 bln USD respectively) (Yongliang and Guanzhon, 2010: 213). Thus this year we can count on the base, on the transition from post-industrial to knowledge-based society). According to this, long-term development strategy must be in the centre of the national development policy.

Such a long-term strategy of knowledge-based economy creation must be based on the theoretical conceptions and include practical differences of Kazakhstan development model.

It is very important to analyse the current governmental vision of the problem and here we need to underline the essential efforts of Kazakhstan state and the President of the Republic. In his recent speech on the strategic vision "Kazakhstan-2050", the President of Kazakhstan highlighted the need to diversify the endowments

of the country to achieve its development objectives. To implement this vision, the authorities are undertaking extensive structural reforms that will define the nature of their human and institutional capacity for the next two decades (Address of the President of the Republic of Kazakhstan N. Nazarbayev to the nation, 2014).

Taken into account such new vision, the government has developed a conceptual framework and strategy for social innovative modernization. The key objectives of the strategy encompass the objectives of innovative education, social protection, health employment and entrepreneurship, throughout the life cycle. Among the main outcomes of such policy are: fostering innovation and creativity, promoting good jobs creation, ensuring proper macroeconomic and labor policy fundamentals and targeted public action to remove context specific constraints to good job creation.

The results of significant government intervention could be observed through the following data. For example, Kazakhstan Index of global competitiveness is growing steadily and for the last 6 years our country improves its position from 66 place in 2008 to 50 in 2013 (The Global Competitiveness Reports, 2013). At the same time, we can observe the raise in the ranking according to the Index of knowledge-based economy – 5 places up from 2000 till 2012 (World Bank, Knowledge Economy Index, 2012). However, if we are going to compare such success on the world scale – it will be seen almost from the other side (Table 1).

Table 1. Index of knowledge-based economy in different countries, 2012

Ranking	Trend 2000-2012	Country	Index of knowledge- based economy	Index of knowledge
1	0	Sweden	9,43	9,38
2	+6	Finland	9,33	9,22
3	0	Denmark	9,16	9,00
...				
55	+9	Russia	5,78	6,96
...				
73	+5	Kazakhstan	5,04	5,4

Source: KEI and KI Indexes 2012. The World Bank Group, July 2012.

It is not enough to be limited to the mere goal of transition to knowledge-based economy, for example gross domestic expenditure on R&D has not grown as fast as GDP in recent years. It declined in absolute terms in 2010, as a result of the delayed impact of the financial crisis, with the ratio to GDP falling to 0.16%, from the average of 0.22% in the 3 preceding years (Agency of Statistics of the Republic of Kazakhstan, 2013). Nowadays, R&D expenditures per capita is 27 USD but still it is far behind the OECD level and, of course, not enough for sustainable innovative development.

Detailed analysis of the governmental policy in the field of innovation development within the project 1899/GF2 "The development of humanitarian technologies in formation of public consciousness of the citizen of intellectual society" was financed by the Ministry of Education and Science of Kazakhstan and International Academy of Business research experience in this sphere, in which we developed the main steps of the long-term strategy to the knowledge-based economy transformation.

I. *First step – More complex and efficient family policy.* In order to secure the quality of human capital the optimal development conditions should be provided for

all children in Kazakhstan to make them happy, well-groomed and able to use their full potential. This entails undertaking not only those activities which are focused on children, but also measures aiming at strengthening the environment in which a child is brought up: family and institutions of early childhood education and care. The state must provide – by means of various legal and fiscal solutions – conditions which will favor having children and setting up stable families. A family will not prosper unless proper conditions for its development are ensured by taking, among others, necessary measures to support it in its educational and economic responsibilities.

Therefore, Kazakhstan needs complex family policies allowing for different life choices related to the presence of parents having little children in the labour market and for a variety of resulting needs.

First of all, it refers to the skills and competencies of teaching staff, their efficient cooperation with parents and ability to perceive children as subjects rather than objects, as well as to the teaching curricula and methods which enable children to develop fundamental competencies. Kazakhstan institutions of early childhood education need to be adapted to the needs of parents and local communities so that they could properly perform their functions. For this reason, forms of early childhood education should be highly diversified, but uniform in terms of high quality performance.

What are the success indicators of such policy?

- Higher number of children per family.
- Higher percentage of children born and brought up in two-parent families.
- Higher percentage of 4 years-old participating in education.
- Higher outlays on child care and preschool education institutions (for children aged 0–6) measured as % of GDP.
- Lower percentage of children exposed to poverty.
- Higher percentage of companies offering employment on flexible terms to parents.

II. Second step -increasing the quality of education. Kazakh schools can be only as good as good Kazakh teachers are. A good school is able to balance its elitist and egalitarian functions. Kazakh schools should cooperate closer with parents in planning children's development and in sharing. Teachers should become one of the most prestigious professions in Kazakhstan. Improvement in the quality of education requires changing the system of selection and recruitment, as well as training, and promotion of teachers. Teaching at school should be an attractive career for able graduates of higher education institutions. Teacher education and training programmes should include practical training to a bigger extent, while teachers' salary levels and career path must be based on the evaluation of their teaching results and should motivate them to continuous development throughout the whole period of their teaching careers. What makes a good school is not only the results achieved by its best students, but also the quality of work with pupils performing poorly. Thus, educational activity must be characterized by the individualized approach to every pupil who should be set challenges suitable for his/her individual abilities and interests. Apart from providing knowledge, school should develop, to a greater extent than it does at present, such attitudes and social skills as creativity, openness and responsibility. This is the only way in which education can be effective in performing its equalizing functions.

The impact of school education upon pupils' attainments is insignificant compared to that of the family relationship capital.

Success indicators are as follows:

- 1) improved average attainment level of the bottom 20% pupils;
- 2) improved average attainment level of the top 20% pupils;
- 3) decrease in the percentage of pupils repeating forms or leaving school early;
- 4) more attractive remuneration for beginning teachers compared with the average national pay;
- 5) higher percentage of the best students choosing pedagogical studies;
- 6) higher level of academic attainment of students choosing teaching as a career;
- 7) higher percentage of parents attending educational courses.

III. *Third step – Focusing the system of education on the needs of the labour market.* The system of higher education in Kazakhstan urgently needs reforms which will make it more responsive to the needs of Kazakhstan's society and economy. The usability of higher education can be increased by selecting and promoting strategic fields of study in the context of changes occurring in human civilization. A reform of teaching methods should emphasize not only the quality of knowledge, but also general competencies enabling students to perform well in a fast changing environment of the labour market. There has been a rapid increase in the scholarization ratio in recent years, but the quality of Kazakhstan education is still a problem.

The usability of higher education can be increased by selecting and promoting strategic fields of study in the context of changes occurring in human civilization. It is also necessary to disseminate information on the forecasted demand for graduates of specific programmes among potential students and to develop a new system of grants and scholarships ensuring better access to the most important fields of study.

Changes in higher education should also involve the management level of higher education institutions, and the academic evaluation system. This requires, among others, ensuring quality HR management in Kazakhstan higher education institutions, beginning with staff recruitment and selection procedures, through competence and performance assessment, ending with career planning programmes.

Success indicators are seen as follows:

- 1) increase in the number of PhD students;
- 2) increase in the percentage of adult Kazakhs involved in educational programs;
- 3) increase in the number of publication in scientific journals from the ISI Master Journal List (<http://ip-science.thomsonreuters.com/mjl>);
- 4) increased percentage of students choosing science and technology fields of study;
- 5) inclusion of Kazakhstan universities in Shanghai Ranking (<http://www.shanghairanking.com>);
- 6) increased share of business sector in science funding;
- 7) increased numbers of holders of academic degrees employed in business;
- 8) increased occupational mobility;
- 9) increase in the number of academic teachers and students participating in foreign exchange programmes and a greater number of foreign students and lecturers in Kazakh universities.

IV. *Activating the potential of senior citizens.* An increase in the level of economic activity of senior citizens can be achieved only as a result of introducing a proper set of policies, which, on the one hand, will discourage elderly people from early retirement, and, at the same time, will enable them to be competitive at the labour market, and protect them against discrimination. Higher participation of senior citizens in education and their increased readiness to undertake jobs are determined by their health status.

Changes in the social benefits system should be followed by an intensive campaign promoting demand for elderly employees. This seems to be even more important since the existing stereotypes, according to which the elderly are perceived as useless, have a consciousness shaping effect both on working population and on senior citizens themselves, who often have low self-esteem.

Success indicators here are:

- 1) higher rate of participation at the labour market for people aged 50+;
- 2) higher average age of retirement;
- 3) higher rate of participation in lifelong education programs among the population aged over 40 years;
- 4) higher healthy life expectancy for people aged 50/60;
- 5) higher percentage of people aged 50+ involved in cultural and social life.

V. *Synergy of science, business and culture, creating value-added workplaces.* Investing in education and human capital development must be coupled with creating new workplaces in Kazakhstan where this huge human potential will be properly used and developed.

Otherwise, well educated and highly qualified professionals will start leaving the country taking advantage of the openness of the globalized world. Instead of directing vast allocations to dying industries and thus helping to keep their privileges, or acquiring short-term investments based on the competitive advantage of cheap labour force, more funds should be allocated to finance those areas in which the country can become competitive in the future.

Thus, on the one hand it is necessary to introduce fully integrated solutions that will support not only Kazakhstan exports, but also the global expansion and the development of business relationships networks of Kazakhs companies.

What is also important is extensive promotion of Kazakhstan and popularization of the success stories of Kazakhs companies and Kazakhs talents in such fields as innovative services, engineering, design, high technologies. On the other hand, it is essential to find ways to effectively attract foreign high value-added investments, which will increase intellectual capital and innovativeness of the country.

Public administration has a huge role to play in raising the innovation awareness of Kazakh entrepreneurs and enterprises, and in increasing their risk acceptance.

VI. *Increasing the quality of business legal environment, procedures and infrastructure.* Kazakhstan may become the most business-friendly environment in the region, provided that the state concentrates on supporting companies and enterprises in increasing their competitiveness, instead of controlling them and hindering their development needlessly. It is a challenging task for public administration and civil service to create good legal support for Kazakhs entrepreneurs, as it involves the imperative to start by changing their own environment.

Efficiently running business requires a reliable, well developed infrastructure, a small fraction of which is the Internet. It needs an extensive network of roads, airports and railways with station buildings, as well as telecommunications and delivery networks, social networks. Circulation of people, goods, and information should not pose a problem.

Civil service should be managed in accordance with the best practices. Public administration institutions should use HR policies, including setting personal goals and key success indicators. It pays to put human potential to good use, e.g. by introducing an interdepartmental staff rotation policy connected with career promotion, and it also pays to stimulate officials to innovate and take responsibility for the development of their institutions.

Success indicators here are the following:

- 1) higher rating in "Doing Business";
- 2) smaller number of export and import procedures;
- 3) shorter time and fewer procedures related to setting up and winding up business;
- 4) lower proportion of time spent by corporate management on dealing with administrative matters;
- 5) lower participation of costs other than pay costs in the total labour costs;
- 6) shorter time on contract enforcement in court;
- 7) broader range of e-administrative services available;
- 8) higher percentage of innovative companies;
- 9) better assessment of cooperation between businesses and higher education institutions;
- 10) increase in the number of patents per 1 mln inhabitants;
- 11) higher share of allocation to research and development projects in the total budgetary allocations for scientific and academic research;
- 12) increased corporate participation in science financing.

VII. *Measuring intellectual capital indicators regularly.* Such countries as Sweden, Israel, or Korea have their reports on the national intellectual capital published regularly, monitoring for changes of the most important indicators which define the national development potential (Lytras, Edvinsson and Ordinez de Pablos, 2007). Other countries, such as Austria (European research area facts and figures, 2013) or Japan, have made it obligatory for higher education institutions and large companies to report on their intellectual capital. The significance of IC indicators measurement is stressed by world famous experts (Lytras, Edvinsson and Ordenez de Pablos, 2007).

In Kazakhstan we had not much experience in IC report creation, so first of all, we need to begin working on this.

Success indicators here are:

- 1) promotion of the reporting on intellectual capital as a good practice done by business, public administrations units, higher education institutions and municipalities;
- 2) higher rate of return on public expenditure on education, health and science;
- 3) higher public awareness of the fact that intellectual capital is the main source of Kazakhstan's potential for development;

4) greater readiness of interest groups to accept reforms aimed at developing the intellectual capital of Kazakhstan.

Conclusions. For Kazakhstan to achieve effective development, there is a need to think about economy transformation from industrial society (as now we have) to knowledge-based economy. In such situation we must increase the quality and quantity of human capital in the society, with the innovation and education system as the main keys to such changes.

Science and education must become a background for innovative development of Kazakhstan. It is necessary now to create the foundations for national competitiveness, to receive benefits and advantages in the future. The basic direction of development should be high-tech production, and export of knowledge, employed in new technologies. Moreover, accumulating governmental and business activities in the innovative sector, putting them in the framework of a long-term strategy will help Kazakhstan achieve a leading position in science, education, human capital quality improvement and as a result – will create an effective economy model based not only on material resources but on knowledge.

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