

Actual issues of management of enterprises of high-tech sector of Ukraine

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The article is devoted to the research of tendencies of the market of high-tech products, to the study of factors internal and external environment of high-tech enterprises that form the structural components of the management of high-tech enterprises based on the recommendations of authoritative international organizations and well-known scientific schools of management. A scheme is proposed to ensure the competitiveness of high-tech enterprise and a complex of measures on state level to improve the process of management of high-tech enterprises and its result.

Keywords: management of enterprises, high-tech enterprises, state regulation, the competitive development, synchronization.

Джур О.Є., Діденко М.В. АКТУАЛЬНІ ПИТАННЯ МЕНЕДЖМЕНТУ ВИСОКОТЕХНОЛОГІЧНИХ ПІДПРИЄМСТВ УКРАЇНИ

Стаття присвячена дослідженню тенденцій ринку високотехнологічної продукції дослідженню факторів внутрішнього та зовнішнього середовища високотехнологічних підприємств, що формують структурні складові менеджменту високотехнологічних підприємств на основі рекомендацій авторитетних міжнародних організацій і відомих наукових шкіл менеджменту. Запропонована схема забезпечення конкурентоспроможності високотехнологічного підприємства та комплекс заходів на державному рівні для поліпшення процесу менеджменту високотехнологічного підприємства та його результативності.

Ключові слова: менеджмент підприємств, високотехнологічні підприємства, державне управління, конкурентоспроможний розвиток, синхронізація.

Джур О.Є., Діденко М.В. АКТУАЛЬНЫЕ ВОПРОСЫ МЕНЕДЖМЕНТА ВИСОКОТЕХНОЛОГИЧЕСКИХ ПРЕДПРИЯТИЙ УКРАИНЫ

Статья посвящена исследованию тенденций рынка високотехнологической продукции, факторов внутренней и внешней среды високотехнологических предприятий, формирующих структурные составляющие менеджмента високотехнологических предприятий на основе рекомендаций авторитетных международных организаций и известных научных школ менеджмента. Предложена схема обеспечения конкурентоспособности високотехнологического предприятия и комплекс мероприятий на государственном уровне для улучшения процесса менеджмента високотехнологического предприятия и его результативности.

Ключевые слова: менеджмент предприятий, високотехнологические предприятия, государственное управление, конкурентоспособное развитие, синхронизация.

Introduction. Many developed countries although in urgent need of various types of raw materials, but very active competitive activity carry out on the market of high-tech products, which has significant added value and its realization brings considerable economic benefits, increase government revenues, stimulate the development of science, technology, education, contributes to the creation of more jobs, development of democratic institutions, improving the quality of life of the population.

The management of the enterprise involves dedicated organizational impact on the activities of the enterprise in the market to achieve the

objectives set and profit for the enterprise. Modern high-tech enterprises of Ukraine are open systems that exist only under condition of active interaction with the environment and, as a rule, have a considerable demand only on the international market. Such enterprises require the participation of a significant number of resources, are created to implement the ambitious plans of the owners and staff. In this case, the condition for viability of an enterprise system is beneficial exchange its «input» and «output».

Modern high-tech business has created an efficient structure and control technology, finds political and legal support in their countries. In

Ukraine high-tech enterprise can not yet boast the same productivity and efficiency. In addition, the period after 2013 was marked by the reduction works in cooperation with Russia, which led, for example, to the crisis in the aerospace industry. It is required analysis, the issues of management of enterprises of high-tech areas related to the formation of an effective internal environment and its coherent interaction with the external environment in terms of political, economic and social crisis in Ukraine.

Brief literature review. Theoretical, methodological, scientific and practical issues of management are constant and urgent field of research of many Ukrainian and foreign authors. Significant scientific contribution to the study of the formation, operation and development of an effective organizational culture made such Ukrainian and foreign researchers, as Albert M., Afanas'ev M., Belinskij P.I., Chmil F., Galickij V.P., Gerchakova I.N., Griffin P., Goncharov Y.V., Daft R.L., Yaromich S., Khedouri F., Kuzmin O., Lukyanova L.M., Manilich V.I., Melnik O., Mescon M., Molotkova I., Naumov A.I., Osovs'ka G., Osovs'kij O., Petrovich J.M., Rudins'ka O., Shegda A., Shekin G.V., Shokun V., Stecenko I., Stadnik V., Vihansky O.S. etc.

Various topical issues of management of high-tech enterprises and aerospace enterprises in both domestic and foreign markets were examined by Degtyarev A.V., Horbulin V.P., Fedulova L.I., Kuchma L.D., Shevtsov A.I., Shekhovtsov V.S., Pylypenko A.V., Zinoviev O.N., Voight S.M. etc.

Unsolved aspects of the problem. Modern domestic and foreign scientific literature fairly well described and analyzed the business structure and organizational management structure in the field of high-tech business. However, the Ukrainian high-tech companies do not show effective dynamics of development and the appropriate level of competitiveness. Therefore, further investigations are necessary for structural components of the management of high-tech enterprises on the basis of the recommendations of authoritative international organizations and well-known scientific schools of management.

Purpose. The article was written for selection of the necessary components of the process management of high-tech enterprises for their further development and competitiveness in the international market.

Result. According to the classification of the The Organisation for Economic Co-operation and Development (OECD) high-tech production is production where R & D costs exceed 3.5% of

the cost of a product, in the case of exceeding the 8.5% of the production is considered to be knowledge intensive.

Based on intensity research (R&D – intensity) OECD distinguishes the following groups of high-tech products: biotechnology and pharmaceuticals; aircraft and spacecraft; medical, precision and optical instruments; radio, television and communication equipment; office, accounting and computing machinery; electrical machinery and apparatus; motor vehicles, trailers and semi-trailers; railroad and transport equipment; chemical and chemical products; machinery and equipment [1].

This sector largely determines the development of the national economy, state functions in the international division of labor. Manufacturing and selling high-tech products with high added value is a very profitable and promising activity, much higher than the trade of raw materials. For example, «Apple» during the last quarter of 2015 received a record quarterly income of 75,9 billion dollars and a record net profit of 18,4 billion dollars (for quarter) [2].

The cost of the iPhone 6 and 6Plus on 24.09.2014 was 227 dollars and 242,5 dollars when the selling price was 649 dollars and 849 dollars, respectively [3]. The cost of Lada Granta in June 2014 was 55 thousand rubles at a sale price of 289 thousand rubles [4].

The common trend of exports of high technology products is shown in fig. 1.

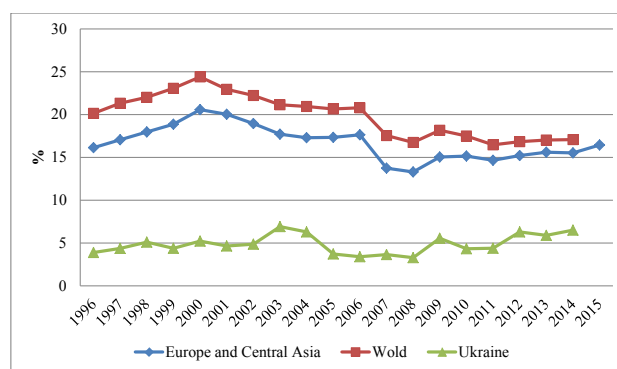


Fig. 1. Comparative dynamics of high – technology exports, % of manufactured exports

Source: prepared by the author based on [5]

Trends of exports of high technology products, presented in Fig. 1 show a significant delay between the performance of the Ukrainian manufacturers from trends in the world and in Europe and Central Asia (include Ukraine), although shows of synchrony of the processes.

In 2014 high – technology exports (% of manufactured exports) in Europe and Central Asia

amounted to 16,443%, and in Ukraine – 6,512%. Presented data indicate serious problems of the Ukrainian enterprises at the micro and macro levels and require optimal solutions to improve the quality of governance at the state level and at the enterprise level.

The management of the enterprise suppose purposeful organizational impact on the activities of the enterprise in the market to achieve the objectives set and profit for the enterprise. Enterprise management includes three aspects: institutional, functional and instrumental. The management efficiency of these levels and activity of the enterprise as a whole is provided by the interaction of the collective, of the parties and investors, suppliers, customers, government and the public.

According to the researchers, state management can be considered effective if it is conducted simultaneously at the following levels:

1) worldoutlook (directionally formed holistic adequate perception of the world at the population of the state and, above all, the senior management personnel due to different tools (education, media, culture) ,when all processes are seen interrelated and interdependent, clearly distinguished causal relationships)

2) historical (the citizens of the state formed a thorough knowledge of their own and world history, the ability to see and understand the direction of the movement of world historical processes, with the result that any speculation in this field should be excluded in principle);

3) informational (the possession of knowledge, including technical and technological nature allow to choose the optimal plans for the development of the productive forces of society);

4) economical (the state must have the necessary economic base to ensure its stable development);

5) genetic (population must be not genetically inferior and physically fit, it is necessary to reduce for a minimum the use of substances, sapping the genetics of the people).

6) military (the state must have a capable armed forces to be able to protect its population and its territory).

A present time it is actively happens tendency of eroding the consciousness of the masses, the formation of a «kaleidoscopic» world, using different tools. A significant impact is on the most active and revolutionary in their character segment of society – the young people, there is dynamically substitution of the highest cultural achievements in human history by mass pseudo-culture.

As noted by Allen Welsh Dulles, lawyer, diplomat, Director of Central Intelligence, it is easy to confuse man by facts, but, if he understands the trends, you can cheat it much harder. In the Ukrainian society now there is no unified, holistic perception of its history, there are evidences of different evaluation of the same events, opposite conclusions are made about the lessons of history, which leads to increased conflicts in society, the complexity of public administration and the development of standards for the humane culture in the society. According to research, drinking alcohol more than 1 liter per capita, leads to an unconscious perception of the events, it becomes possible to impose any political decisions; and World Health Organization (WHO) research showed that irreversible degradation of the gene pool – that is, the degeneration of the nation – begins by drinking 6-8 litres of alcohol per year per capita. According to the «Global status report on alcohol and health in 2016», the Ukrainians in the age of 15 drink an average of 13,9 liters of pure alcohol per year [4].

The World Bank notes that more generally, the recent geopolitical tensions holding back global growth. The reduction in production especially in the three affected countries – Yemen, Libya and Ukraine, whose share in world GDP was about half a percentage point in 2013 – reduced world output by 0,1 percentage point in 2014-2015. To ensure the sustainability in the emerging market and developing countries, the World Bank recommends to policymakers reduce macroeconomic and financial vulnerabilities and to restore the stability of the economy through reforms to improve the performance [5].

For a clearer understanding of the formation of high-tech production use the system approach: basis, the main foundation of the high-tech sectors of the economy (and not only economy) is education (1st level), which prepares staff for the science (2nd level), the next level is the economic environment (3rd level: the availability of credit, market, competition, legal support, government support), followed by «sub-sectors – pillars» (4 th level: instrument making, information technology, electronics, nanotechnology), and they are based «sub industry – not pillars» (5th level: aircraft building, space industry, biotechnology, robotics, etc.). For the effective functioning of this system requires productive work of each of its components. The failure of one level of this system are passed along the chain of the whole system. The society faster will feel the results especially for higher the level (for example, failures in the education system plainly

manifest after 10-15 years, and results from any industry will be seen in a few years).

One of the main problems of development of high technologies is the presence of concentration in one place of the intellectual "capacity," and capital. This problem is partially allows to solve the presence of technology parks, which allows in one place to create a system that will produce research, develop and implement in production technology, to manufacture products and to respond quickly to any changes. This way used many economically developed countries. In Ukraine registered 16 technoparks, of which only 8 are actually working. In addition, it should be noted that currently within one country is problematic to create the entire production chain. This is one of the factors in the emergence of transnational companies. In this situation it is advisable to have three key components – management, financial and production.

General economic situation has strong impact on high-tech sectors of the economy also. At present time, in the economic system of Ukraine is possible to identify the following tendencies: a) worsening of economic situation in the country: the decline of GDP, industrial production, real incomes of the population (declining of GDP in 2014 amounted to 6.6%, in 2015 – 9.9%) [7]; b) the outflow of capital from the economy (mainly from industry); c) the growth dependence on raw materials, a significant portion of investment is directed to the extraction of raw materials; d) rapidly increasing national debt (public and publicly guaranteed debt to 31.08.2016 is 66,59 billion dollars) [8].

It is necessary to highlight the interest rate of the National Bank of Ukraine (NBU), under which it gives loans to commercial banks, which is 14% (for comparison: Bank of China – 6%, Federal Reserve System (FRS) of USA – 0,5%, the Bank of Japan – from 0 to 0,1%, the Central Bank of Germany – from 0.30 to 0.50%).

It is quite clear that at rate of return of 4% receiving the loan with a rate of 20% and above is highly detrimental for production. The particularly high capital intensity is specificity of high-tech industries

It is also useful to identify the main economic «brakes»: the uncertainty of the economic situation, the unstable exchange rate of the hryvnia (UAH), declining domestic demand, high taxation, high energy prices, the complexity of bureaucratic procedures, high corruption, competition from imports, the quality of the legislative regulation of the economy, lack of investment, the monopolization of the market, imperfection of

the judicial system, competition from the shadow economy, the depreciation (over 70%) and lack of modern equipment.

Especially noteworthy are the problems in the sphere of education and science. One of the main problems is low wages. According to statistics, the average salary of educator in December 2015 amounted to 4145 UAH at the average salary in the country 5230 UAH. It is decreasing the number of organizations that conduct research and development (from 1344 in 1991 to 978 in 2015). Rapidly decreasing number of scientific workers from 313079 in 1990 to 63864 people in 2015, i.e. almost 5 times. At the same time almost doubled the number of professors and assistant of professors in the economy (decreased growth of highly qualified scientific personnel in the material sphere of the economy).

As a consequence, the share of scientific and scientific-technical work in the GDP declined from 1,36% in 1996 to 0,64 per cent in 2015, the share of enterprises engaged in innovation has not changed, despite the global growth of science and technology (18% in 2000 and 16,1% in 2014). The proportion of industrial enterprises that introduce innovations in its production decreased from 14,8% in 2000 to 12,1% in 2014. And the weight of the realized innovation products in the total industrial production dropped from 9,4% in 2000 to 1,4% in 2015[12].

In the scientific literature very well known functions of management are planning, organizing, staffing, directing and controlling (Koontz and O'Donnel) [7].

Modern authors to the functions of management include a) innovation goal setting, planning, decision making, disposal, motivation, organization, coordination, conflict resolution and responsibility, communication (V.I. Khomyakov); b) the acquisition, preservation, production, transportation and distribution (D. Borman, V. Vorotina, R. Federman); c) personnel; equipment, materials, production; finance; information (K. Killen) [8].

One of the reputable organizations which focuses on management at various levels is the International Organization for Standardization (ISO). She has developed a fairly wide range of standards for management systems. They are a model in the creation and operation of the management system of enterprises of different type. Like all ISO standards, they are the result of an international consensus of experts. Therefore, the implementation of the standard on management system, organizations can benefit from global experience in management and good practices. Modern practice management as with

all ISO standards are based on the principle of continuous improvement.

Modern high-tech enterprise for growth and providing of added value tend to develop technology and human capital that enables them to find, maintain and create competitive advantage. The analysis of the activities of high-tech aerospace business and the recommendations of the international organization for standardization allowed the authors to present a scheme of ensuring the competitiveness of high-tech enterprises (for example enterprises of the space industry) based on the requirements to management system of enterprise (fig. 2).

The development of science and technology helps obtaining to the owners of inventions, new technologies and devices additional income

(quasi rent), due to the qualities and uniqueness of the new product. The owner of new inventions and technologies receives the quasi rent as long as his product or innovation will not get general distribution. Therefore, the disregard solution of the above problems in Ukraine for many years push it possibility of joining the group of countries with a post-industrial economy and the question of real improvement of life of the population.

Conclusions. The boosting performance of modern Ukrainian enterprises requires the creation of an optimal system of management based on international standards and best business practices examples business, as well as the implementation of the following measures: 1) the creation of a powerful banking system for accumulation of funds for the development of high-

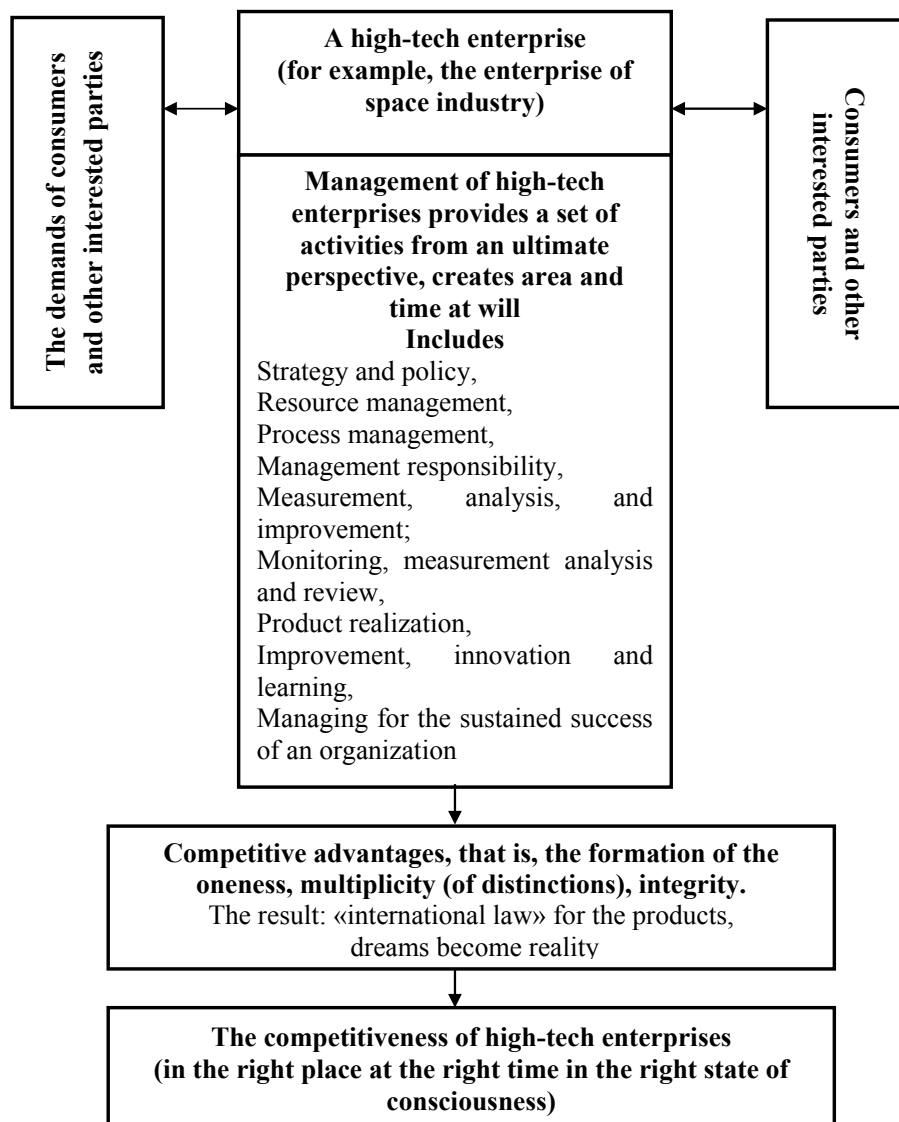


Figure 2. Scheme of ensuring of the competitiveness of high-tech enterprises based on the requirements to the management system of enterprise

tech industries (availability of soft loans for these sectors: interest rates on loans must be either zero or at least not to exceed the rate of profitability of enterprises), 2) large-scale government programs of investment in material production; 3) reforming the pricing system; 4) participation in global production chains that create high-tech products; 5) technical modernization of production; 6) use of funds accelerated depreciation of the means of production produced on the territory of Ukraine; 7) establishment of the regres-

sive scale of social insurance payments depending on the level of productivity in the enterprise; 8) inclusion of R & D expenditure in the structure of production costs, bringing them from taxation; 9) low import duties on means of production for high-tech industries; 10) introducing a system of indicative planning ", the electronic model of the economy," able on the basis of interregional and interindustrial balances to predict the production volumes and consumption, determine infrastructure needs, resources, etc.

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