POTENTIAL OF NEW MANAGEMENT TECHNOLOGIES FOR GROWTH OF THE INDUSTRIAL COMPANIES' EFFICIENCY

Anna E. Gorokhova – Jana M. Šafránková – Vladimir D. Sekerin

Abstract

In the paper the role and potential opportunities of scenario technologies in the industrial company management as a factor of their efficiency growth are investigated. In modern conditions of managing top managers of the Russian industrial companies faced the requirement to replace with passive with active tools and methods of planning and forecasting. Potential of passive forecasts of the industrial enterprises development gives the chance only to reduce the level of uncertainty of the future, and active forecasts allow operating future. Positive characteristics and a scope of scenario technologies at management of the industrial company are proved.

Key words: management technologies, industrial company, forecasting method, planning method, scenario technologies of management

JEL Code: L11, O 31

Introduction

Prompt entry of Russia into the market caused a set of practical and theoretical problems in various spheres of public life of the country. Now there are deep system transformations in the Russian economy (Sekerin, 2012). At the micro level they are characterized by process of economic subjects' transformation, transformation of the directions and conditions of their financial and economic activity, emergence of essentially new control system of the organizations and enterprises (Veselovskij & Abrashkin, 2013).

The Russian economy develops according to world tendencies. The managing communications between the enterprises become more difficult. There are special forms of integration caused by the increasing competition in the internal and external markets that demands continuous monitoring of a business environment and development of the strategic development plan of the enterprises (Lyasnikov et al., 2014). Not the possession of capital

resources and material values, but ability to development and deployment of innovations becomes the main instrument of the competition (Šikýř, 2011). Innovations are key driving forces of the increase of competitiveness (Carayannies & Grigoroudis, 2014) and these are especially technology innovations that are indispensable for every enterprise (Zhang & Yang, 2013).

In this regard, modern technologies become the leading force defining development of any industrial enterprise (Sun, 2015). In the international market they can make even the small enterprises by significant players. Especially small industrial enterprises need different sources and technologies to remain active and effective (Park et al., 2013). At the large industrial enterprises in modern conditions design management style on the basis of a combination of orientation to the consumer and involvements of the personnel into activity of the company is formed (Boyko, Sekerin & Šafránková, 2014). Thus disappearance of hierarchical levels at the industrial enterprises, rigid vertical hierarchical structures of management is noted. Replacement of the hierarchical structure of management of flexible matrix structure which arose at the beginning of the 20th century as a result of process of division of administrative work takes place.

1 The value of strategic planning for increase of the industrial companies' efficiency

In the conditions of globalization the hyper competition phenomenon reflecting the growing competition denomination and considered as a new stage of a denomination of the markets is of particular importance. Hyper competition was incompatible with the fundamental principles of the old doctrine about strategy and demands to reorient completely strategic planning of the industrial enterprises development. Thus, the concept of stable market and branch structures is hopelessly obsolete. In modern conditions the industrial enterprises quickly gain competitive advantages and so quickly lose them.

Emergence and development of a new strategic planning paradigm at the industrial enterprises caused the increased interest in flexible virtual organizational forms, in the system theory and theory of complexity, in the structural reorientation of strategic planning which is based on the concept of key competences. Key competence represents a collective design which covers a set of separate competences, forming complete, all-firm ability to solve strategic problems. Feature of key competence that it arises as result of collective process of training which coordinates separate abilities in a whole. (Veselovskij & Abrashkin, 2013)

In modern conditions in various industrial branches the urgent need in increase of accuracy of long-term development plans of the enterprises was created. The industrial enterprises have to develop independently the assortment portfolio now and provide success of the functioning in the market while in former conditions of command system of managing the majority of them almost completely were aimed only at execution of the orders created by various ministries. Therefore in modern conditions development and deployment in practical activities of new methods and instruments of management in the field of forecasting and planning is represented actual. It is useful to investigate and critically to estimate possibility of adaptation to modern Russian experimental conditions of management of the industrial companies in the countries with the developed market economy. (Dudin et al., 2014b)

2 Potential of management scenario technologies for growth of the industrial companies' efficiency

Now many foreign companies widely use scenario technologies of management. Expediency of development of scenario forecasting technologies for the concrete industrial enterprise is caused by their ability considerably to reduce risk of emergence of situations which can make implementation of the financial plan for the current year impossible and ruinously affect a financial condition of the company, and also reduce time of response to sudden changes in the external and internal environment. (Sekerin, 2012)

Research relevance of the directions of management scenario technologies adaptation to domestic practice of conducting financial and economic activity is caused by insufficiency of development of methodological base for formation of scenarios in Russia. The main difficulty of introduction in practical activities of scenario technologies consists in insufficient degree of development of methodical materials on this subject, as in concrete branch, and in general in the Russian Federation. The importance of introduction of methods and instruments of scenario forecasting emphasizes the fact of existence both in Russian, and in world economy of the crisis phenomena and tendencies. In modern conditions many foreign companies use the technologies and tools allowing to predict future tendencies in economy therefore they are capable not only to minimize possible damage, but also to benefit by the arising situations, the Russian industrial enterprises only react to already occurred events, applying an arsenal of the methods and tools directed on situational updating of budgets and financial plans. (Lyasnikov et al., 2014)

Today the technologies of scenario forecasting for the first time applied by the commercial enterprises in the early seventies of the 20th century give the chance, to receive the most authentic long-term forecasts of economy and geopolitics development. As the example showing expediency of construction and application of scenario technologies 'Oil shock' of 1973 can serve so-called. The Shell company, having managed to predict introduction of the oil embargo and properly to be prepared for it, I entered ten the largest oil and gas companies of the world. In the same time other companies in the emergency order revised the budgets and solved how to work further.

The management of the Russian industrial enterprises in modern conditions of hyper competition has to solve a problem of replacement of passive methods and instruments of forecasting for the active (Dudin et al., 2014a). Difference between them is that the passive forecast of management object development can quite be carried to instruments of underestimation of the future uncertainty degree while the active or self-actualizing forecast belongs to category of the future management instruments. The active forecast is rather effective remedy of information management of large political, social and economic systems. It is self-fulfilling prophecy – a prediction which directly or indirectly influences reality in such a way that as a result inevitably is true (Dudin et al., 2014b). Though motives of the self-executed prophecy can be tracked in myths of Ancient Greece and India, the term was spread in the XX century by the American sociologist Merton (1968). This tool, is widely used to management of political systems, however, as practice shows, it can also be applied and to management of economic and market systems.

Practical application of passive scenario forecasts justifies itself as the instrument of decrease in degree of uncertainty of the future, for example Global Trends 2020: 'Mapping the Global Future', and active forecasts – as the making element of the market policy directed on increase of efficiency of activity of the industrial enterprise. Examples, similar forecasts, forecasts of the Airbus and Boeing companies which, according to the author, didn't reflect as active, but at the same time successfully self-actualize at the expense of high degree of trust to them potential clients can act.

Scenarios technology, representing one of the 'oldest' methods of forecasting, we received the rebirth in the sixties of the last century. Critical researches of consecutive set of the expected materials National Intelligence Council of the USA, Royal Dutch Shell and forecasts of Goldman Sachs 'Dreams of group of the countries of BRIC: A way in 2050',

allowed revealing the following dynamics of transformation of technology of scenario forecasting:

- unintentional transformation of the forecast to the active forecast, on the example of work of Goldman Sachs. Speaking about the active forecast, it must be kept in mind that even if developers of the forecast didn't set as the purpose to create the active forecast, plausible, widely known forecast can become that;
- the scenario forecast, on the example of 'Global Scenarios 1995-2020', in the active scenario forecast, on the example of 'Global Scenarios 2001-2020';
- the scenario forecast from means of reduction of degree of uncertainty of the future, on the example of Global Trends 2015, in the self-actualizing scenario forecast with elements of means of information management of the future, on the example of Global Trends 2020;
- the scenario forecast as means of information management of the future on the example of Global Trends 2025 in Forsythe on the example of Global Trends 2030.

The Shell one of the first began to use technology of scenario forecasting in practice, thus having positioned it at early stages separately from strategic policy of the company. Initial forecasts of Shell were created only for internal use, acted as a trade secret of the company and were one of essential competitive advantages to formation of reliable long-term development plans of the company.

As main goal of the device of scenario forecasting minimization of uncertainty of the future acted. For example, the account when forecasting of the revealed key indeterminacy capable to have serious impact on all world economy, on a certain sector of economy or even on the concrete company, and also main driving forces which are characteristics of key indeterminacy.

Investigating the published forecasts of Shell (since 1992 Global Scenarios 1992-2020 and to Global Scenarios 2001-2020), it is possible to note essential differences from the scenario works of Global Trends 2010-2030 developed and published by NIC of the USA. They consist in ways of submission of expected information to the reader.

The main difference of Global Scenarios 2001-2020 is that it is possible to call this scenario forecast active. Transition from the scenario forecast to the active scenario forecast is realized as follows: in the text are given not only concrete instructions to managers how to use the provided scenarios, but as well justifications to those messages why it is favourable to

managers to use these scenario materials; there is a feedback with readers; scenarios in details describe influence of effects on business.

It should be noted that the previous forecast of Global Scenarios 1998-2020 had some elements inherent in the active forecast, however it is rather for approbation, than for information management and was a certain "transitional" stage between the scenario and active scenario forecast.

From the above-stated analysis it is possible to draw a conclusion that scenario forecasts represent rather reliable way of anticipation of the future, but, at the same time, they are rather expensive tools. Advantages of this approach is that with its help, the company, as a rule, sees slightly farther, than her competitors and can occupy emerging markets, earlier, than other enterprises. Also, scenario approach allows designating more effectively future risks for the company and it is thus better to prepare it for the crisis phenomena.

Scenario planning well recommended in the industry and in the sphere of business. However in many respects subjective and heuristic character of this method gives an inconvenience to many scientists. How the company can learn, whether it developed the correct scenario? If yes, how on its basis to make the correct administrative decisions? Unfortunately, these problems take place to be, and more difficult to solve them nearly, than to create the scenario.

One of restrictions of a method scenario forecasting is subjective character as process of formation of the forecast depends on collective perception of surrounding reality. Really, it is very widespread trap. But it is impossible, having created some scenarios, to choose the best and to consider it as only the important. The future is multivariatny therefore one line of succession of events not in forces to capture all range of probabilities. Other trap consists in too literal reading of scenarios. Sometimes, the company perceives the line of future events, as something static as the simple card of future events which by all means will occur exactly as it is described. Actually, the purpose of the scenario is to connect the present and the future, but not in static, and in a flexible form which as will be possible it is more widely capable to reflect development of the future.

As other restriction of a method acts is what data are taken as a principle future construction. Often, one key uncertainty which is considered general gets out in the beginning, and already making a start from it, further researches are conducted. Thus, 2-4 any scenarios moving from one starting point as a result turn out. The main problem of this method that if other key uncertainty will be chosen, with confidence it is possible to claim that

there will be absolutely various scenarios. As far as they are truthful, will depend on, whether all possible lines of development of the future will be analysed in the course of adoption of administrative decisions, and in what degree other variable factors are considered in development of the future. Anyway, the question, whether is the scenario truthful, isn't absolutely correct. Criterion of "quality" is here ability to outline options of the possible future properly. Thus it is important not to try to simplify excessively results for convenience of further use. Any tool which will try to simplify a complex picture, will only introduce distortions, whether it be a simple map or a set of alternative options of the future. It is necessary to consider that the system seldom when will decay on simple elements and to prompt obvious decisions. However nevertheless it is impossible to forget about basic interactions. Even in the nature, interacting with environment elements, for example, water can be in 3 various states: in a usual state – liquid, when heating – gas, when cooling – a solid body. Art of creation of scenarios also consists in search of such natural educations and metamorphoses of object in behaviour of difficult system.

Besides some, subjectivity inherent in registration of the scenario, the method can suffer from an inefficiency of development and various internal traps. Generally these traps are connected with how process is carried out in the organizations (for example, a line-up, a role of intermediaries, a creative component, etc.), and also from what main directions get out for the scenario (short term planning, global or regional).

One more restriction of scenario planning in the conditions of the industrial enterprises is its weak level of integration into other methods of planning and forecasting acts. The method is independent. Indicators on the analysis or communication systems which are considered – all this has to be analysed during development of the scenario. It is difficult for perception as well as for the received results.

Scenario planning is the effective instrument of average and long-term strategic planning in the conditions of the uncertain future. When using a method of scenario planning at the enterprise it is necessary to define the technology suitable to the concrete enterprise and to develop system of decision-making. The system of decision-making is necessary competently to use results of forecasting. We will consider the scenario TAIDA technology and model of decision-making.

Usually each person analyzes the situation surrounding him and creates alternative options of succession of events. Thus, if to try to formalize that according to the person has to happen, a certain history will turn out. Thus, the brain of the person carries out the constant analysis,

defines a situation and defines possible alternative ways of succession of events. This process was turned into the scheme of scenario planning and the technology under the name «TAIDA» is received. For the last decades on the basis of this model the set of scenario projects was created. In certain cases they were carried out by experts, but most often their development was connected with interactive processes where the considerable part of work was made by the working groups.

Five stages TAIDA.

1. Supervision. The first step in the course of TAIDA — supervision. A main goal of this step is detection and the description of those changes in world around which can have impact on a key problem. First of all, it is expedient to concentrate on the reasons to begin process. Scenario planning can have the different purposes. That it is more important: to create prerequisites for transformations to the organizations or to choose the correct direction and to work? On what it is necessary to be focused: on search of new business or on improvement of the old? The methods applied in processes of scenario planning and also results of these processes essentially depend on a combination of the purpose and an orientation

2. Analysis. After end of a stage of supervision it is necessary to analyse the revealed changes and to develop scenarios.

3. Creation of an image. Creation of vision of a picture of the future after all ideas concerning the most plausible options of the future are collected.

4. Decision-making. At this stage of process is defined the directions of development and strategy necessary for opposition to threats, realization of vision and performance of objectives.

5. Action. Plans in itself seldom bring specifically established results. Action consists in taking certain steps towards their realization and to analyse their consequences. Thus, the decision-making model at the enterprise too has to function properly.

Conclusion

Thus, the modern economic system at the industrial enterprise carries out a large number of functions, thus their circle extends. There is actual a requirement purposeful 'formations of the future' based on the complex solution of technical and technological, resource, social and environmental problems which aggravation in the future is obvious. In the theory application of technology of scenario forecasting will allow to receive the scenario of enterprise development, and also competitive advantage before other manufacturing firms of production.

In practice, it will allow to minimize damage from sudden changes of the market, and also in advance prepares for important events which will take place in the future and will have essential impact on the company. Practical use in activity of the industrial enterprises of active forecasts has high potential as means of competitive fight, nevertheless, formation and application of these forecasts and becomes possible only after development by employees of the industrial enterprise of technologies of creation of scenario forecasts.

References

Boyko, J., Sekerin, V., & Šafránková, J. M. (2014) New Approaches to Efficiency Estimation in Strategic Planning. In Loster, T. Pavelka, T. (Eds.), *The 8th International Days of Statistics and Economics* (pp. 161-170). Retrieved from http://msed.vse.cz/msed_2014/article/454-Boyko-Julia-paper.pdf

Carayannis, E., & Grigoroudis, E. (2014). Linking innovation, productivity, and competitiveness: implications for policy and practice. *Journal of Technology Transfer*, 39(2), 199-218.

Dudin, M. N., Lyasnikov, N. V., Sekerin, V. D., & Gorokhova, A. E. (2014a). Historical aspects of global transformation of engineering thought in industry and agriculture in the context of changing the technological modes. *American-Eurasian Journal of Sustainable Agriculture*, 8(6), 17-22.

Dudin, M. N., Lyasnikov, N. V., Veselovsky, M. Y., Sekerin, V. D., & Aleksakhina, V. G. (2014b). The problem of forecasting and modeling of the innovative development of social-economic systems and structures. *Life Science Journal*, 11(8), 549-552.

Lyasnikov, N. V., Dudin, M. N., Sekerin, V. D., Veselovsky, M. Y., & Aleksakhina, V. G. (2014). The national innovation system: The conditions of its making and factors in its development. *Life Science Journal*, 11(6), 535-538.

Merton, R. K. (1968). *Social Theory and Social Structure* (1st ed.). New York: Free Press.

Sekerin, V. D. (2012). *Инновационный маркетинг* (*Innovative marketing*) (1st ed.). Moscow: INFRA-M.

Sun, Z. (2015). Technology innovation and entrepreneurial state: the development of China's high-speed rail industry. *Technology Analysis & Strategic Management*, 27(6), 646-659.

Park, M., Jang, Y., Lee, H.-S., Ahn, C., & Yoon, Y.-S. (2013). Application of knowledge management technologies in Korean small and medium-sized construction companies. *KSCR Journal of Civil Engineering*, 17(1), 22-32.

Šikýř, M. (2011). Determinants of employee performance: how to achieve sustained competitive advantage. In Loster, T. Pavelka, T. (Eds.), *The 5th International Days of*

Statistics and Economics (pp. 606-614). Retrieved from http://msed.vse.cz/files/2011/Sikyr.pdf

Veselovskij, M. Â., & Abrashkin, M. S. (2013). Теоретические подходы к определению эффективности деятельности промышленных предприятий (Theoretical approaches to the determination of the effectiveness of the industrial enterprises), *Вопросы региональной экономики*, 3, 107-115.

Zhang, Z. Y., & Yang, Z. (2013). Interaction Mechanism between Enterprises' Business Model Innovation and Technology Innovation. *Psychology, Management and Social Science*, 15, 282-289.

Contact

Anna E. Gorokhova

Moscow State University of Mechanical Engineering (MAMI), Institute of Economics and Management Department of Economics and Industrial Management

107023, Moscow, Bolshaya Semenovskaya str., 38, Russian Federation

agor_80@mail.ru

Jana M. Šafránková

Czech Technical University in Prague, Masaryk Institute of Advanced Studies

Kolejni 2637/2a, 160 00 Prague 6, Czech Republic

jana.safrankova@muvs.cvut.cz

Vladimir D. Sekerin

Moscow State University of Mechanical Engineering (MAMI), Institute of Economics and Management Department of Economics and Industrial Management

107023, Moscow, Bolshaya Semenovskaya str., 38, Russian Federation

bcintermarket@yandex.ru