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BI TECHNOLOGIES IN MODELLING ENTERPRISE MANAGEMENT ACTIVITIES

Summary. This paper studied the principles and methods of system analysis of economic objects and processes in conditions of instability and the impact of various types of risks. Methodological apparatus of information technologies in simulation management of the company was developed.

Keywords: business intelligence technology, informatiom technology, management system, risk, performance.

TECHNOLOGIE BI W ZARZĄDZANIU PRZEDSIĘBIORSTWEM

Streszczenie. W artykule przedstawiono zasady i metody BI w zarządzaniu przedsiębiorstwem. Praca skupia się na aspektach ekonomicznych, procesach warunkujących brak stabilności w działalności przedsiębiorstwa oraz wpływie różnych rodzajów ryzyka. Wskazano instrumentarium metodologiczne dotyczące symulacji zarządzania przedsiębiorstwem.

Słowa kluczowe: technologia *business intelligence*, technologia informacyjna, system zarządzania, ryzyko.

1. Introduction

At the current stage the company economic system is seen as an open and challenging. Complexity is defined by ambiguity of its behavior in an environment characterized by volatile situation. System is exposed to different risks [1, 2]. This requires solving problems associated with the need to develop information system management in the new economic conditions, including: strategy development and functioning; transition to new, more effective methods and tools for enterprise management based on ownership; handling of large amounts of information that needs real-time processing. So, the goal of article is to develope methodological apparatus of business intelligence and information technologies in company simulation management.

The modern information age set priorities, knowing as information, high intelligence of social processes, and sharpening competition, globalization, the rapid introduction of high technology and saving technologies. Success in ensuring the financial sustainability of production is largely dependent on the conditions of exposure assessment of different risks on the results of the study. Creation of a methodological device to solve this problem is based on the use of the principles and methods of system analysis will help determine the functioning of such an option in which the products produced by the plant will be competitive. At present not enough attention is paid to the issues of the use in the operation of the enterprise information technology. Management information systems provide the management accounting function object and serve as a link between economic activity and the people who make decisions [2].

In studies of complex systems there is a problem of decision making, which is successfully resolved by simulations. Mathematical analysis involves the construction of formal models, which leads to a set of variants of the business operation, including the need to find a version that will be adequate to the current situation, resource opportunities and financial security. The problem of decision making is more complex in the active systems that describe a wide range of tasks of economic activity. They characterize disabilities of formal presentation that have unexpected and multivariate behavior [8]. Active economies differ in that way that significant amount of information exists in the form of representation in the person mind, who makes decisions, and have a fuzzy mathematical content. For such situations, there is no effective mathematical tools that would show blurred representation and no quantative criteria. This stimulates the search for new solutions to the problems of strategic management.

2. Application of BI technology in the company management

Business process operation is a set of actions on the use of the market and their capacity in terms of the uncertainty of the external and internal environment. One possible approach to this problem is the development of the main areas of the enterprise, analysis and evaluation of internal and external factors to justify a management decision in a competitive environment. Analysis of external and internal environment factors enables the function to set the goals of the enterprise, depending on factors that influenced it, the skillful use of which can significantly improve the financial and economic performance of the company [11].

The net financial result of the company is the profit or loss, which determines the ratio of income and expenses. Profit is a universal measure of successful enterprise. However, from a methodological point of view, the main objective of the enterprise - profit maximization in pure form, is very rare. It is therefore necessary in the operation of the enterprise for the purpose set than pure profit maximization and sustainable profits that can be obtained taking into account all factors that affect the company.

An analysis of external and internal environment factors [7] are necessary to justify the investment program for the most efficient development and operation of the business. The criterion of the enterprise, in connection with the above, is to maximize the return on investment capital. As a final indicator of the best rate of return on investment to the value or return on investment capital (IC), defined as profit from sales divided by the amount of investment. This rate is the best indicator of the company ability to use the investment and is calculated as

$$IC = \frac{SP}{I} \cdot 100\% = (\frac{SP}{V}) \cdot (\frac{V}{I}) \cdot 100\% = REN \cdot IT, \tag{1}$$

Where: SP – sales profit; I – the amount of investment; V – sale net proceeds; REN – return on sales; IT – the rotation rate of investment.

Thus, the rate is influenced by two major factors - the return on sales (profit margin) and the reversibility of investment.

While enterprise simulation we should analyze the different types of risks in order to assess the risk of a particular kind of financial position; determine the level of risk and the development of measures to reduce risk.

Economic risk is measured by the coefficient of risk k_m and is equal to $k_m = \frac{M^-}{M^+}$, where M^-, M^+ - the expected value of the economic indicator as a random variable distributed according to a certain law. The hazard ratio k_m expresses the ratio of negative values and expectations of additional economic indicators deviations from plan. Risk weight of the enterprise as a whole is a function that depends on the values of economic indicators

characterizing the process of managing and defining experts for each variant function. Then, $\Re_{ij}(x_{ij})$ - the value of risk that sets the i-th expert for the j-th variant function. Each j-option based peer review will have a value at risk, which is installed as $\Re'_j(x_j) = \prod_{i=1}^{j} \Re_{ij}(x_{ij})$, where I – experts number. This expression has the force when each option depends on each other, that operation of the business moves from one option to the other gradually.

But versions of the enterprise are considered so that are independent of each other, that each option has the right to independent existence. Then the value of the enterprise risk factor when choosing the j-th option will be calculated using the formula:

$$\Re_j(x_j) = 1 - \prod_{i=1}^{j}(1 - \Re_{ij}(x_{ij})) \tag{2}$$

Each version of the j-th operation of the business is characterized by a set of economic indicators, among which are the following: IC_j – a factor which is defined as income from sales company, divided by the amount of investment by j option; I_j – the amount of investment needed for the functioning of the j version of the company; REN_j – return on sales in the j variant of the enterprise, which is calculated by the formula $REN_j = \dfrac{SP_j}{V_j}$ where SP_j – income from sales by j option functioning; V_j – net revenue (profit) from sales of enterprise by j option functioning; REN – Return on sales on a moment of decision on the choice of options for further business operation.

It is necessary to maximize the utilization rate of investment by selling products under the conditions of business operation in a risk situation [3].

$$F(x_j) = \max_{j \in J} IK_j \cdot \Re_j(x_j) \tag{3}$$

with just the following limitations:

– the amount of investment required for business enterprises in risk situations should be no more than the amount of which will satisfy process performance. Loans should be taken to the extent necessary for business

$$k(x) = I_j \cdot \Re_j(x_j) \le K \tag{4}$$

– return on sales of products under the chosen j-th variant of the enterprise in a risk situation should not be less than a certain level, because otherwise it would mean that much or could increase the cost of production [8], or significantly decrease the net proceeds from sales. The latter can be when activities are not competitive, or if decreased demand for the products of the company, etc.:

$$r(x) = REN_j \cdot \Re_j(x_j) \geq REN, \tag{5}$$

where REN-return on sales at the time of the decision on the choice of options for further business operation.

In this case

$$x_j = 0 \vee 1; j = \overline{1, J}, \tag{6}$$

and $\Re_j(x_j)$ – non-negative, additive, monotone functions of discrete arguments that are given analytically.

The problem described by (3) - (6), the mathematical formulation is discrete programming problem. The complexity of the solution is determined by the size of the set of possible variants of the enterprise.

The main goal of company management is targeting the management process for all objectives facing now: profit, gain market share, eliminate rivals like. Therefore, in such a context, management turns into a business intelligence system that provides the following functions [4, 11]: coordination of management activities to achieve company goals; information and advisory support management decisions; establishment and operation of information systems management.

Objectives of management are further complicated in the face of uncertainty, therefore it is necessary to make amendments to the incompleteness of information. Uncertainty and risk generated by it are inevitable in almost all taken economic decisions [1, 6, 9]. A specific feature of uncertainty is that entrepreneurs should consider the impact of uncertainty not only domestic market but also outside, which is a consequence of the various countries economies integration [5, 7, 10].

3. Conclusions

Thus, one method of solving the problem of decision-making under uncertainty and risk is the use of information technology in the management of the company. Management information systems provide the function of accounting in business management and serve as a link between business enterprises and people who make decisions.

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The research found that one method of solving the decision making problem is the use of business intelligence in the company management.

Omówienie

Obecne działania firmy muszą przesunąć się w kierunku nowych, bardziej skutecznych metod i środków kontroli. Wymaga to zastosowania rozwiązań z obszaru modelowania zarządzania przedsiębiorstwem oraz technologii informatycznych. Obecnie na niskim poziomie poświęca się uwagę kwestiom technologii informatycznych przedsiębiorstwa w kontekście ich efektywnego funkcjonowania.

W artykule przedstawiono wyniki badań dotyczących zasad i metod analizy systemu instytucji i procesów gospodarczych w warunkach niepewności i ryzyka. Przedstawiono,

które narzędzia analityczne BI zostały opracowane do symulacji zarządzania przedsiębiorstwem. Tworzenie narzędzi analitycznych rozwiązywania takich problemów na podstawie wykorzystania zgodnie z zasadami i metodyką analizy systemów pomoże określić możliwość funkcjonowania przedsiębiorstwa na rynku i umożliwi odpowiedź na pytanie, które produkty będą konkurencyjne na rynku.

Badania wykazały, że jednym ze sposobów rozwiązania problemu podejmowania decyzji jest wykorzystanie Business Intelligence w zarządzaniu firmą.

ORGANIZACJE POZARZĄDOWE A KAPITAŁ SPOŁECZNY

Streszczenie. Sektor organizacji pozarządowych w głównej mierze jest ukierunkowany na rozwiązywanie problemów społecznych. Organizacje te cechuje dobrowolne uczestnictwo, chęć współpracy, zaangażowanie, zaufanie wyznawanie podobnych norm, wartości. Organizacje pozarządowe przyczyniają się do wzrostu aktywizacji społeczności lokalnych, stanowią zatem ważny czynnik rozwoju kapitału społecznego. Kapitał społeczny to wyznawane normy, wartości, sieci powiązań, zaangażowanie, zaufanie. Odpowiednie wykorzystanie może przyczynić się budowy i rozwoju lokalnej wspólnoty. Celem artykułu jest wskazanie roli organizacji pozarządowych w rozwoju kapitału społecznego oraz zaproponowanie rekomendacji w celu wzrostu jego wartości na poziomie lokalnym. W artykule w szczególności należało odpowiedzi na następujące pytania: jaką funkcje pełnią organizacje pozarządowe w rozwoju kapitału społecznego oraz w jaki sposób organizacje te mogą rozwijać potencjał kapitału społecznego? Na podstawie przeprowadzonej analizy autor zaproponował rekomendacje dotyczące rozwoju kapitału społecznego na rzecz przedsiębiorstw społecznej, publicznej i gospodarczej.

Słowa kluczowe: organizacje pozarządowe, kapitał społeczny

NON-GOVERNMENTAL ORGANISATIONS AND SOCIAL CAPITAL

Summary. To a significant extent the NGO sector is aimed at solving social problems. These organizations are characterized by: voluntary participation, willingness to cooperate, commitment, confidence, carrying similar and/or social norms and values NGOs contribute to the increase in activation of local communities and therefore they are an important factor in the development of social capital. The social capital consists of accepted social norms, values, social networks, commitment and trust. When the social capital is used properly it can contribute to the construction and development of the local community. The aim of this article is to identify the role of NGOs in the development of social capital and to propose recommendations (in order to increase its value at the local level). The article, in particular, answers to the following questions: what is the role of government