

The concept of creation and use of the polycriterial diagnostics systems of enterprise activity

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Abstract. The objective reason for the development of the tendencies causing transition from monocriterial to polycriterial approach in the diagnostics of enterprises' functioning and the need for a systematic approach in this area is grounded. The concept of formation and use of the systems of polycriterial diagnostics of enterprises on the basis of selection and specification of the key structural elements of such systems is developed.

Key words: polycriterial diagnostics, system, structural components, concept, enterprise.

INTRODUCTION

Management of an enterprise as a complex economic system under the conditions of dynamic changes of the market environment cannot be effective without qualitative information-analytical basis, which is formed as a result of realization of diagnostics procedures. Diagnostics is an integral part of the management system of every enterprise as it is aimed at evaluation and identification of retrospective, current, and prospective situation with the purpose of creating an information basis for the development of preventive, reorganizational and reactive managerial decisions directed at the problems solution and taking advantage of the chances offered by the functioning environment. At present one can observe important changes of conceptual direction of diagnostics systems at enterprises: the shift from monocriterial diagnostics to polycriterial one is taking place. Polycriterial diagnostics uses the system of motivated criteria which characterize the limits of the functioning optimum of an enterprise in different scopes of business activity and create the basis for multivector all-round evaluation of an enterprise. Such tendencies are logically motivated as long as under present-day conditions evaluation of enterprise activity is impossible to be directed only by one criterion of the effectiveness of its activity. However according to the facts from practice, it rather often oc-

curs that an enterprise may be profitable but insolvent, it may be highly-technological but unprofitable, it may possess a substantial market share but go bankrupt, etc. At the same time the existing conceptual, theoretically-methodological and applied developments in the sphere of diagnostics are characterized by a large variety of methodical, regulatory-criteria and identifying support, lack of uniformity and universality in the diagnostics of identical objects, neglect of all essential components during target diagnosing, hence unsystematic character of diagnostics. It causes disparate and incongruous diagnostics results obtained by different evaluating subjects, gives the opportunity to purposefully manipulate such results which produces negative effect on the efficiency of the enterprise functioning due to taking managerial decisions inadequate to the conditions of functioning of the enterprise. All the above-mentioned factors cause a necessity to develop a concept of creation and use of the systems of polycriterial diagnostics at the enterprises.

ANALYSIS OF THE LITERATURE ON THE PROBLEM

Despite the importance of diagnostics for enterprises, it has gained a specific theoretical and methodological execution only during the recent decades. Significant contribution into the development of the conceptual basis of the enterprise activity diagnostics was made by such foreign scientists as K. Adams, K. Cross, P. Druker, P. Horwart, J. Juran, R. Kaplan, R. Lynch, K. MacNyre, L. Maisel, M. Miller, P. Neeven, D. Norton, G. Ober-Kreeye, P. Rober, Y. Shyffer, K. Wallsh, U. Weber, etc. The problems of methodological and methodical support of enterprise functioning diagnostics is also considered by Ukrainian scientists: O. Amosha, G. Bashnyanyn, M. Chumachenko, A. Chuhno, A. Dmytrenko, V. Hera-

symchuk, O. Hetman, S. Ischuk, M. Kyzym, L. Kostyrko, R. Kostyrko, O. Kuzmin, U. Lysenko, V. Miklovdá, T. Momot, O. Moroz, O. Oleksyuk, Sh. Omarov, O. Smetanyuk, V. Shapoval, G. Shvydenko, V. Vasylenko, A. Voronkova, I. Yaremko, T. Zagorna and others. However, significant differences in theoretical and practical support of enterprise functioning diagnostics on the whole and its individual sectors, ungrounded criterion support of diagnosis of different levels and complexity, lack of integrity in the interaction of diagnostics components, regulatory inconsistency in this area lead to the need for the development of theoretical and methodological basis of creation and use of polycriterial diagnostics systems of enterprise functioning.

THE PURPOSE OF THE PAPER

The development of the concept of formation and use of the enterprises polycriterial diagnostics systems based on structural decomposition of such systems and detailed specifications of the key components is the purpose of the paper.

PRESENTATION OF THE MAIN RESEARCH MATERIAL

It is stated that at the present day conditions of enterprise functioning there is a tendency to move from monocriterial principles in diagnostics to polycriterial ones which is proved on the basis of the research of the genesis of diagnostic systems, namely: Joseph Juran's system [1], Balanced Scorecard system (Balanced Scorecard – BSC) [2-4], Lorenz Maisel's system of indicators [5], the French system of evaluation Tableau de bord (Tb) [6], K. MacNayre's, R. Lynch and C. Cross' pyramid of efficiency [7], "Stakeholder" system [8], DuPont's systems [9], analysis systems (SWOT [10], ABC [11], XYZ [12], SPACE [8], PEST [8]), diagnostic systems based on the economic-mathematic modeling [13-15] etc.

Having studied the literature on the problem and the practice of functioning of the domestic enterprises it has been suggested to interpret the term "diagnostics of the enterprise" as target evaluation and identification of its state, its tendencies and development prospects on the basis of its business indicators aimed at creation of structural information database allowing to make reasonable managerial decisions directed at elimination of trouble-causing situations and weak points of the enterprise or in order to take advantage of the functioning conditions and strong points of the enterprise. Polycriterial diagnostics in contrast to monocriterial diagnostics is aimed at evaluation of complex economic objects of the higher level which are characterized by multicomponent, differently-vectorial, and diverse features. Such kind of diagnostics operates the system of well-grounded criteria used to evaluate and identificate the functioning of the

enterprise in general and its specific areas (spheres, types of activity, subdivisions, etc.)

Despite the objective necessity to apply systemic approach in diagnostics of enterprise functioning, comprehension, components and structure of the diagnostics system is not sufficiently described and featured. The executed research enables to consider the polycriterial diagnostics of enterprise functioning as a totality of subjects, objects, goals, procedures, methods, diagnostics methodologies, business indicators, criteria, and resources which in a varietal and configurative interaction provide the performance of the target diagnostic functions (Fig.1) [16, 17].

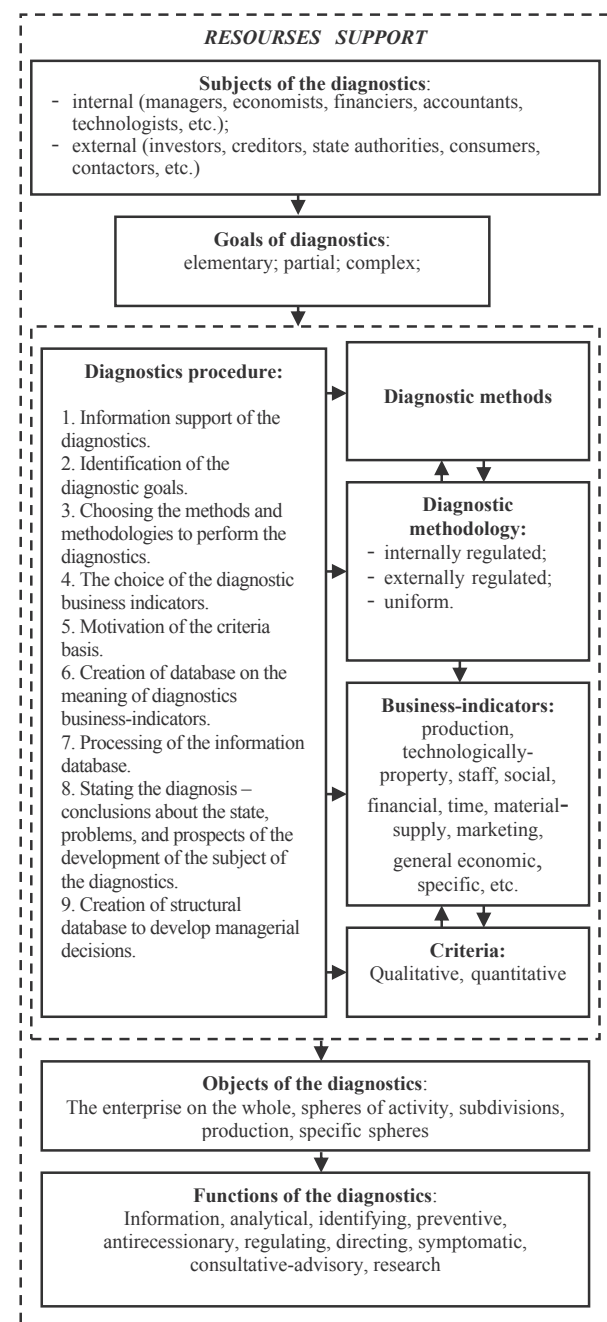


Fig. 1. The typical structure of polycriterial system of enterprise activity diagnostics

The key components of the diagnostics system of enterprise activity are the subjects of the diagnostics, i.e. interested parties, namely: owners, managers, subject specialists of the enterprise (economists, book-keepers, distributors, suppliers, marketing specialists, designers, technologists, planners, etc.)

Every subject of the diagnostics follows its specific goals (elementary, partial or complex), which subsequently determine the methods, methodologies, composition and structure of business-indicators as well as diagnostics criteria combined in logical sequence by means of polycriterial diagnostics technology. Elementary goals are referred to the lowest level and provide for the evaluation and identification of certain aspects of the activity of the enterprise activity (profitability, liquidity, capital productivity, and solvency). Partial goals are directed at diagnostics of such activity spheres as productive, financial, logistics, investment, innovative, and others. Complex goals are referred to the highest level as they are the most complicated and cover simultaneous evaluation of the key spheres of the enterprise activity. Examples of the complex diagnostics goals are evaluation of the competitiveness, investment attraction, development, and businesses potential [18].

The objects of the diagnostics at the enterprises may be specific business-indicators, spheres of activity, its financial, technological, property situation, competitiveness, investment attraction, etc.

In practice there are a lot of problems connected with the procedure of the use of the polycriterial diagnostics as long as violation of its logical sequence may level the obtained results. The procedure of the use of the polycriterial diagnostics of the enterprise one should understand logically grounded sequence of preparatory, main and final stages of the diagnostics of the enterprise activity which enables to combine dynamically the key elements of the diagnostics system. The stages of the polycriterial diagnostics procedure are shown in Fig.1.

It was found out that the validity and reliability of the diagnostics is significantly affected by the diagnostics methods adequate to operating conditions, intended purpose and resource capabilities. It was proposed under the diagnostics methods to understand the ways and methods of target evaluation and identification of (retrospective, current, prospective) situation of the objects aimed at information support for managerial decisions about the operation of the enterprise as a whole and its individual sectors. Based on the review of the literature classification of the diagnostics methods according to the list of features was developed (Fig. 2). Therefore, it is appropriate to classify diagnostic methods according to the following characteristics [19]:

1. According to the form of assessment:

- quantitative methods: involve the use of mathematical and statistical procedures:
- qualitative methods are based on experience, knowledge, intuition, competence of the subjects of diagnostics, etc.

2. According to the form of representation:

- factual (laboratory analysis, control acquisition, control measurements, timing, inventory, examination, experiment);
- calculating and analytical (technical and economic calculations, analytical evaluation, arithmetic test, economic and mathematical modeling, etc.);
- documentary (logical test, documents counter check, the test of all transactions, diagrams, data consolidation, etc. reflected in documentation).

3. By reasoning:

- theoretical: abstraction, idealization, axiomatic, induction, deduction, generalization, synthesis;
- empirical: experiment, examination, calculations, measurements, tests.

4. According to the number of criteria:

- monocriterial: based on the research facility for one criteria;
- polycriterial: providing research facility using the system of criteria.

5. According to the nature of the studied relationships:

- linear (simplex method, method of the transportation problem);
- non-linear (analysis of variance, the dynamics and statistical analysis, correlation and regression modeling, matrix method).

6. According to the orientation:

- methods of forecasting diagnostics: diagnostics aimed at the future state of an object in tactical and strategic dimensions;
- methods of current diagnostics: envisioning the diagnostics of the current state of an object;
- methods of retrospective diagnostics: designed to assess the situation and development facility of an object in the past.

7. According to versatility:

- uniform: may be applied to any object of diagnostics;
- highly specialized: intended to diagnose specific objects.

8. According to the level of research:

- analysis: dynamic (trending), comparative, structural (vertical), index, coefficient, factor;
- synthesis: direct, element-theoretical, structural and genetic.

9. According to the degree of formalization:

- non-formalized (methods of peer reviews, scripts, psychological, morphological, comparative, tabular, graphical);
- formalized (statistics, accounting, economics and mathematics) and others.

The key factors determining the choice of diagnostic methods (goals, objectives, object of diagnostics, information support, qualifications of the diagnostics subjects, maintenance and software, stability of the operation environment, etc.) are pointed out. Selected methods of diagnostics will determine the nature of the methodologies that specify instructions, algorithms, and description of diagnostic procedures.

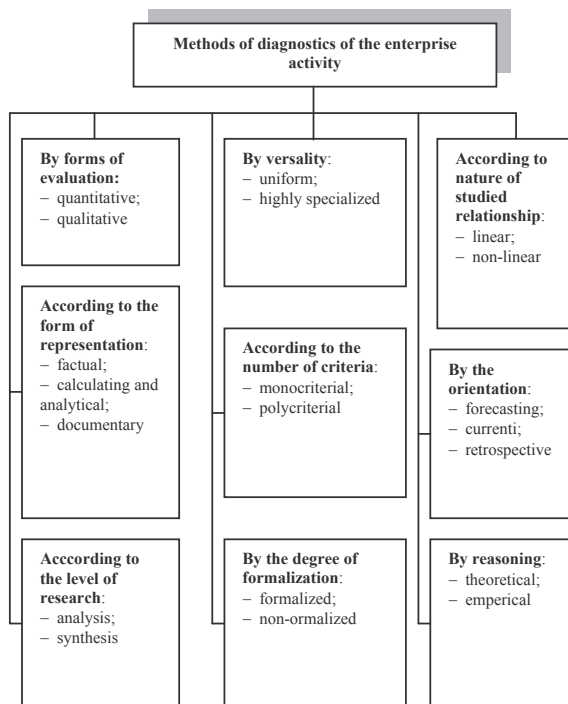


Fig. 2. The classification of enterprises' activity diagnostics methods

Criteria can be formed at the enterprise (in the internal environment) as well as by the representatives of the external environment (suppliers, state authorities, consumers, etc.). The level of their prescription may be different: microeconomic (at an enterprise level), mezzoeconomic (branch of industry), macroeconomic (at a state level), global (international). According to the content the criteria are outlined as economic, technological, personnel, production, social depending on business indicators for which they are formed. In terms of validity criteria can be highly substantiated using specific methods of timing, measurement, experimentation, etc.; partially substantiated if they are formed on the basis of statistics, correlation and regression methods, which provide some level of error; unreasonable, if they are formed without any theoretical and practical confirmation. By the degree of specialization they distinguish: universal criteria that are suitable for companies of different profiles, sizes, types of activity; specialized criteria applied to specific narrow operations, work performance and features and are different for enterprises of different economic activities; special criteria in contrast to above mentioned are formed only in exceptional cases for exclusive operations, work, types of production [20].

Methodology of diagnostics specifies a list of operations, actions, formulas, business indicators, criteria used to diagnose certain object. It should be noted that some subjects of assessment (e.g. state authorities, banks, etc.) in the diagnosis of certain business areas are governed by the requirements and methodologies, which are reflected in the current legal framework. But other subjects use specialized diagnostic techniques widely described in

the specialized, educational or scientific literature. At the present time there is a critical need to ensure unification of diagnostic techniques in key areas.

As business indicators are the central element of the polycriterial diagnostics systems, the conceptual apparatus in this area has been given more accurate definition, thus the substance of the category "business indicator" has obtained concrete definition. The term business indicators is suggested to note the quantitative indexes of properties, state and development of the enterprise and its components, with which diagnostics monitor subjects, identify and predict trends of changes in selected areas of the organization activity in a particular business environment. Based on the review of the literature and the study of the practice of business indicators at the enterprises classification of business indicators by a number of essential features (type of activity, representing of the results, level of particularity, manner of expression, source of information, method of obtaining, directing, the object of the diagnostics, an area of distribution, level of significance, level of generalization, interpretive term, the nature, the content, reflection of the level of the used resources, relation with the functioning environment), which allows the subjects of the diagnostics to choose the appropriate diagnostics indicators depending on the purpose of the diagnostics.

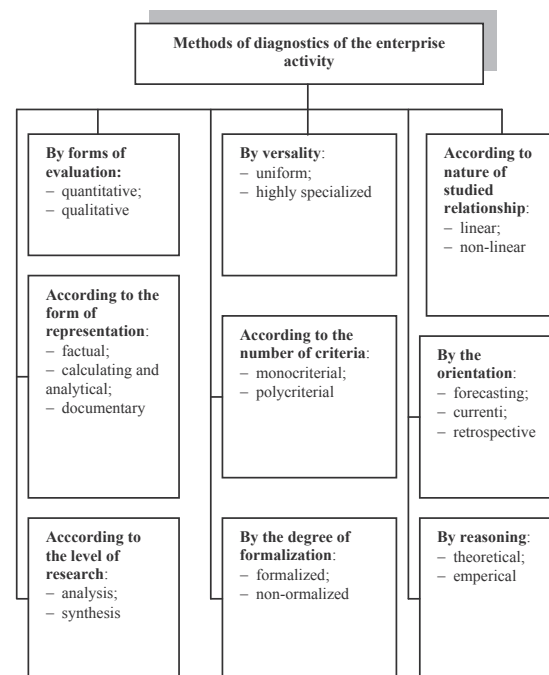


Fig. 3. Classification of the criteria of diagnostic business-indicators

Taking into consideration that the systems of polycriterial diagnostics are based on the use of the reasonable ramified criteria framework, the concept of "diagnostics criteria" and "criterion of business indicator" are differentiated. A set of parameters that form the basis for assessment and identification of selected objects is considered under the term criteria of diagnostics, and under

the term criteria of business indicators – a measure that reflects the best value, ranges or trends, and form the basis for comparison with the actual values of the business indicators. Classification of the criteria for business indicators is developed (Fig. 3). By mapping quantitative criteria (formed as a specific quantitative parameters or ranges) and qualitative criteria (take the form of preferred trends) are singled out.

The form of criteria presenting (absolute and relative) depends on the presentation of business indicators. According to the nature of discrete criteria formation (shown as a specific number) and interval criteria (formed as ranges, limits) are distinguished. As for the level of formalization of the criteria, then if they are approved, resolved, legitimated in some legal way, it shows that they are formalized, otherwise – criteria are non-formalized, and bear information and recommendation status. The level of legitimization of the criteria determines their obligation of use or their information and recommendation role.

It is worth mentioning that polycriterial diagnostics of the enterprise activity is not performed for the sake of the process, it aims at an achievement and performance of its inherent functions, at implementation of certain types of activity. Based on the results of research the priority of features in diagnostics systems at Ukrainian enterprises is stated (Fig. 4). It is found out that anti-crisis feature in modern conditions is a priority for 91% of surveyed firms which is natural, because the systemic financial crisis, money scarcity, inflation, catastrophic decline of effective demand, currency volatility significantly complicate the activities of enterprises in Ukraine and Europe targeting them not at the development but at survival. The activity of any enterprise in the development process is accompanied by a set of crises – from local to global. In particular, during the launching of the enterprise it is dangerous to suffer the crisis of underfunding, lack of competitiveness, forcing out of the market; at the stage of growth – the crisis, formed under the influence of exogenous factors (customers, competitors, suppliers, financial institutions); at the stage of decline – the crisis of insolvency, unprofitability, loss of market positions, bankruptcy, etc. Crisis conditions are normal in the enterprise functioning, the problem is how adequately the control system can respond to their origin and course. According to the experts, the origin of the crisis at the enterprise is stated by a significant list of symptoms: loss of sales and production, the negative values of liquidity, profitability, business activity, property, financial stability, high turnover of the staff, lack of competitive products, etc. And as experience shows, up to 80% of firms are unable to overcome the crisis and are displaced from the market. However, the crisis for each enterprise should be seen as opportunity for development, as according to the basic philosophical concepts, the development is the result of the struggle of contradictions, and constructive conflict. In critical conditions it is particularly important for enterprises capability and ability to identify crises, their causes, to assess the threat and the consequences for making appropriate management decisions, which actual-

ize the problems of implementation and use of diagnostic systems in organizations that allow to estimate the scale of the problems on-line, identify ways and directions to overcome them and to develop anti-crisis measures.

Information, analytical and identification diagnostic features are basic in various operating conditions, because evaluation and identification of the business activity in order to develop the information database for managerial decision making is the main task of polycriterial diagnostics.

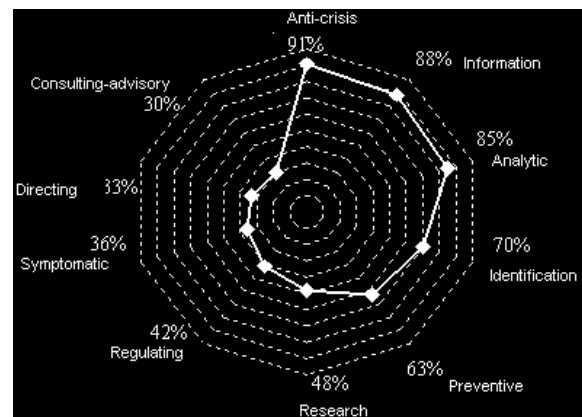


Fig. 4. Priority of diagnostic functions of Ukrainian enterprises

CONCLUSIONS

At the present stage companies operate in conditions that are characterized by dynamism, variability, increasing competition, increasing consumer demands for products parameters, the influence of the global financial crisis, etc. Therefore, in the enterprise diagnostics the conceptual focus shifts from monocriterial to polycriterial assessment of states, parameters, components of functioning, which lead to the actualization of multilevel integrated assessment of target objects. Moreover, efficiency, effectiveness and quality of the enterprise polycriterial diagnostics greatly depend on the methodological and methodical support of this process, the validity of the regulatory criteria, and accuracy of the information database which necessitates the use of a systemic approach that allows taking into account all significant and integral elements. Taking all the above-mentioned facts into consideration, the concept of creation and use of the polycriterial diagnostic systems at the enterprises is suggested on the basis of justification of the decomposition structure of typical elements of such systems (subjects, objects, purposes, diagnostic procedures, business indicators, criteria, methods, methodologies) to perform inherent diagnostic functions.

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