Criteria and key components of indicators of the conceptual principles of the enterprises monitoring

Kryteria i kluczowe składowe indykatorów koncepcyjnych podstaw monitoringu przedsiębiorstw

Igor Chulipa
Easteuropean National University named by Lesya Ukrainka (Ukraine, Lutsk)

**Summary**
The paper investigates and analyzes the conceptual basis of the enterprise monitoring system, criteria and key elements of monitoring systems functioning, methods and feasibility of the integral index calculation of financial and economic viability, the impact of unpredictable long-term global economic environment and its uncertainty in the composition of the indexes included in the monitoring system.

**Streszczenie**
Opracowanie zawiera badanie i analizę teoretycznych podstaw systemu monitorowania przedsiębiorstw, kryteriów i kluczowych elementów systemu monitorowania wydajności, a także metod i możliwości obliczenia integralnego wskaźnika rentowności finansowej i ekonomicznej oraz wpływu nieprzewidywalnego w długim terminie globalnego otoczenia gospodarczego i jego niepewności na zestaw indeksów zawartych w systemie monitorowania.

**Key words:** monitoring, business activity, financial and economic indexes, integral factor of functioning criteria, enterprise sustainability, the economic environment

**Słowa kluczowe:** monitoring, działalność gospodarcza, finansowe i gospodarcze wskaźniki, integralne kryteria wydajności czynników, zrównoważony rozwój przedsiębiorstwa, ocenie gospodarcze
**Introduction.** Early detection, analysis and exemplification of company problematic aspects is the main purpose of enterprise monitoring. However, one even perfect and reliable statement of deviations from the expected results of the monitoring system is not enough to describe the system as effective one; this component of information and analytical support of management should interpret by its methods the results and form meaningful conclusions, coordinated with the strategy of the company development in the context of general trends in the economy. That's why, to build a reliable monitoring system it is necessary at first to supply the high quality of its basic elements – evaluation criteria, selection and composition indicators consistency, the format of measuring process, method of study results and their adequate interpretation.

**The main material.** Criterion is one of the most important in the theory of effectiveness evaluation and therefore it is considered as the sign, the means of judgment, under which the assessment is made, a measurement and evaluation factor that determines the basic approaches to measuring effectiveness. To perform this function of the general characteristics of the functioning efficiency criterion should be an integral feature that displays the most significant results of the decision impact on the main goal of the company. Some aspects are characterized by the economic indicator – level measuring and extent of constituents of evaluated effectiveness. A common approach to the conceptual basis of forming of evaluation system of the enterprise status and activity provides use of a certain sequence – from the criteria through the summary indexes to individual indexes. It is assumed that the general indexes are characterized by a certain level of abstraction and universality, and certain indicators are the meaningful characteristics.

The obvious fact is that the monitoring is able to fulfil its functions only with the help of coordinated and coherent economic indexes, which represent the absolute and relative numerical properties of objects, phenomena and processes of business. An important condition of economic indicators monitoring is their relationship, their possibility to reflect dynamic of phenomena and processes, to show trends of development and causal laws. Herewith the criteria characterization of the economic indicator is the kind of measure of assessment upon which opinion is formed about the value or meaning of a particular index in the overall system.

To provide management with necessary information that would be sufficient and productive to support effective management decisions, first of all, is to select relevant economic indexes to describe the enterprise on a certain (specific) market segment. From this disposition such system of monitoring is described as the operational database of events and processes that are described sufficiently by small number of key, particularly important indexes. Minimum is proposed for operative diagnosis of the object of study.

There appears the problem of selection of indexes for integrated assessment of all the most essential aspect of a multifaceted enterprise activity and diagnose of
weaknesses in the work, which generally characterize the level of enterprise efficiency. The common vector of their orientation, the structure of generalizing and individual indexes are necessary conditions for the formation of indexes in the monitoring system of the enterprise; the formation of the indicative component for an enterprise is the key to the effectiveness of this system in enterprise management.

Key indicative components of monitoring system are formed on the basis of formal financial, economic and statistical data using the methods of factor analysis, which allows on the basis of relationships between parameters to detect generalized characteristics and trends of the studied process. In addition, it is supposed that the task of factor analysis is reduction of little informed or, as they are described „noise“ variables, that is the reduction of data [1, p.86]. In many studies these indexes are considered to be entropic part, which acts as the measure of disorder in any system. For this, the authors propose to carry out in tracking trends of internal and external efficiency “on the basis of economic indicators to reduce entropy” for reliability in analytical and diagnostic systems [2]. These figures emphasize the advantages of formal indexes over peer review.

In either variant qualitative characteristic of indexes which are entered both into the monitoring, and to any other analytical system has always played a pivotal role. For monitoring system input information (internal and external, formalized and non-formalized) in fact notes the efficiency of this analytical and forecasting system, and “the more investigated the influence of factors on the value of the effective rate, the more accurate forecasting results of this index” [3, p. 102 ].

Tools of analytical base of aggregation of numerical indices are excessively broad, and that's why allow to construct a large number of multiform synthetic parameters (coefficients). It can be noted that in many cases “the same factors are often called in different ways, so in literature there are many terms, although in reality they are much less” [4, p. 50].

That information from the full range of background information is important which can really increase the effectiveness of management decisions. To outline the importance of the quality characteristics of aggregates, problematic definitions of the various dimensions of quality, one can note the embedded IMF “Data Quality Assurance Framework”. This system aims to evaluate the quality and quality measurement framework of statistical information [5]. On the level of monitoring system of the certain enterprise this problem is offered to solve in different ways. For example, by the studying of design methodology of financial monitoring system [6, p. 89], the task of information filtering is proposed to solve on the basis of heuristic filter design for tracking incorrect data or incorrect physical or mathematical dimension.

Besides of qualitative characteristics, the set of indexes largely depends on the specific of economics, organizational structure and economic ties with market partners, the level of industry competition, etc. Therefore, monitoring-diagnostic
system of the enterprise is often described as a “creative process, variable in content, which is carried out by various analytical techniques” [7, p. 34]. Another important area of quality selection of indexes is their context with the strategic goals of the enterprise (gaining of market segment, capitalization asset, profitability or elementary avoiding of bankruptcy or ability to function).

Company management considers its function as effective decisions based on an analysis of indexes and key indicators formed on the enterprise by information-analytical systems including the monitoring. The above requires from the system developing of several alternatives, and they depend on the factors which take into account the influence dynamic factors on the of the company indexes. In national practice, “for the study of information in the enterprise, there exists a set of methods and tools which allow you to analyze only from the point of view of “flat perception”, while the modern conditions of enterprises operating require to perceive information in more complex space” [8, p. 121]. Ability of monitoring system in manoeuvring by the indicative component of indexes company activity makes it leaner and more practical than other systems.

In general, most authors mainly comply with terms that it is feasible to limit array of key indexes that should be investigated to support management decisions regarding the efficient operation of the enterprise, that is “it is necessary to determine the optimal number of groups of financial indicators (the least) and to calculate their value” [9, p. 125]. It is supposed that this format provides the greatest efficiency and effectiveness of measures to correct current activities, taking into consideration the presence of a stochastic relationship between selected factors and their impact on the achievement of targets. The choice of the relevant factors and effectiveness indexes functioning is individual for each company, even within the engineering industry. Although sometimes there is the opposite point of view. However, our study of engineering companies makes for us possible to have practical conclusion – the key indicators for each of these businesses are different.

Exploring the development of organizational and methodological principles of monitoring O. H. Penkova concludes that the monitoring as a management tool provides a comprehensive assessment and prediction direction of the enterprise for stable system of indexes [10, p. 51]. Implementation of this requirement is justified by its focus on further analysis and comparability of results. Without any doubt, this approach to teaching the monitoring methodological principles provides the standardization of information set, ease of finding and fixing a set of data and gives to the monitoring properties of information process. However, from our point of view, such proposed blocked monitoring system with its extremely specific format and given probabilistic cause-effect phenomena, on the contrary should be considered as the unresolved part of problem of monitoring systems conceptual basic. In addition, the perception of this approach to the development
of monitoring enterprise system inevitably leads to false, from our point of view, targeting the conceptual framework of constructing a monitoring theory.

Such format for a particular enterprise may prerequisite skewed depth of different factors representation which are important namely for it and shift focus attention on one, and thus weakening of control over the other (probably crucial for this business) aspects of the business. The undeniable fact is that the structured indexes will enhance the function of the comparison of the industry enterprises, but obviously weaken its effectiveness for direct management by a particular company. Here we make a comment that it concerns the enterprise monitoring system, but not forming of analytical information at the corporate level. From this position we share the conclusion of this thesis made by E.E. Ionin, in which “standardized calculation of important analytical indexes would allow to statistical authorities through processing and synthesis of information to give it in the context of companies, industries, and also in regions and across the state” [11, p. 152].

Composite indicator formed on this principle (independently whether it is calculated on the basis of a linear combination of indexes or equilibrium approach or any other complex method) has primarily pre-prescribed weight of each component. However, the key factors that influence the effectiveness of each entity are not exactly alike. That’s why M. Klements and D. Hendry emphasize that indicator is any variable that has a reliable informative about another variable which is interested in [12, s. 207]. In our case there is mutual interdependence and direct influence of economic indexes of a particular company taking into consideration its characteristics, economic conditions, market conditions and a number of other social, economic and financial factors. By and large monitoring system needs to consider the “environmental” and “infrastructure” parameters.

Formation of total integrated index of effectiveness estimation is undoubtedly one of the most important tasks both of monitoring and general information system in general. In the scientific work [13, p. 9] by the analysis of evaluation methods of managing by the effective functioning of the company there noted such their disadvantages as lack of general integral index, which simplifies the management analysis and evaluation and at the same time it is pointed to the incomplete coverage of all the factors affecting the dynamics of the enterprise activity.

Sure construction of enterprise monitoring system requires balancing on a very thin and sensitive facet of simplicity and comprehensiveness. Trying to combine these two aspects sometimes one can find in the literature conclusions about multi-objective approach to effectiveness evaluation, and this in fact is mixing of the criteria category of and efficiency indicators [14, p. 47]. Offered information aggregation methods can be supported into the monitoring system which provide “calculating of aggregate (total) indexes for other modules of monitoring mechanism of the financial and economic situation of the company” [6, p. 90].
For those types of monitoring, during which the indirect dimension takes place, including monitoring of informal and unstable in their nature economic activity indexes of engineering companies, a major problem is to ensure the establishment of evaluation criteria, methodical process measurement algorithm, the correction results and their adequate interpretation. The modern business situation is changing almost every day, and the dynamic, developed on this basis, the indicative indexes allow to the management staff to pay attention to those activity aspects, which require surgical intervention.

In almost unpredictable for long term global economic environment and its uncertainty, each negative course of action effect may have several variants, which cannot be evaluated on the basis of the mere probability. In our view, one can eliminate the significant degree of uncertainty by using the formation of several alternative scenarios: an increase in information reduces uncertainty (entropy) of monitoring systems. We adhere to the position that the enterprise monitoring system should adapt to the specific conditions and its original product as part of the overall information system should correspond the criteria of relevance and adequacy to real economy displays. Experts, who study the state and prospects of development of the information-analytical system in this context, note that “given examples of monitoring and even of monitoring systems indicate that they will continue to be created and develop, and its methodology must be improved... “[15, p. 25].

Indexes that are entered into the monitoring system should cover not only the activity characteristics of the particular company directly, but also the characteristics of the industry, market conjuncture, current and expected situation about credit and investment resources and so on. On this basis generalized direction of monitoring development as “system building including monitoring, assessment and prediction of the environment and its impact on the activities of the company due to changes in economic conditions“ are formed [7].

Economic situation (set of economic conditions, relationships, situations) can significantly affect the implementation of planned programs, it is except of this, showing dynamically not always predictable behaviour objects and phenomena set. Internal rationalism and external conditions in its entirety and synergies influence the efficiency index of building enterprise functioning. At present, under the terms of efficiency we talk not only about income increase, but primarily of financial, economic and productive capacity of the enterprise as the ability of the company to future functioning and the value of its investment properties. Criterion characteristics of this index is the most important indicator for external contractors (investors and creditors), and therefore should compose the monitoring basis of financial and economic indexes of building enterprise.

In the research of T.N. Malykhina on the basis of empirical facts points out that in the analysis the factors of financial position are “priority”, by the long-term one – factors of effectiveness significantly increase [16, p. 5]. This approach is ap-
Igor Chulipa

Criteria and key components of indicators of the conceptual principles of the... | 145

propriate for today’s world economic practice, and therefore monitoring systems tend to expand their base and base projections by the forecasting and expected indexes as to the development the national economy (exchange rates, inflation levels, etc.). As, for example, competitiveness index (GCI), which is characterized by “a useful tool in the analysis of key macroeconomic and of institutional elements” [17, p. 31]. This index describes the ability of the national economy to achieve stability or economic growth in the medium term. The company as a “cell in the body of the market environment” is functionally able to operate only in terms of the efficiency equally to the state of social and economic environment. Modern current practice of enterprise functioning additionally confirmed lack of analysis approaches that too closed on the indicative basis of the enterprise index and industry analysts.

Researches of the published conceptual frameworks and methodological bases, declared principles and approaches to organizational structure of monitoring economic indexes demonstrate their diversity and differences. From the standpoint of the tasks practical services company, providing indexes monitoring of ongoing activities, this process is the controlling and balancing of a large number of parameters including those that are unique to a particular company – regional character, convenient location relatively to customers and suppliers, infrastructure positioning of firms and so on. Tools of analytical indicators aggregating basis are extremely wide, including even many intuitive indicators. That’s why, it is announced that it’s impossible to bring all their multiplicity in any method, but to use only those that truly have an impact on the effectiveness of management decisions: “For effective company management it is not enough to have “dashboard” which represents the performance in a convenient form, quickly and accurately. It is important that these indicators were effective “[18, p. 26].

In a relatively stable economy economic standardized indicators format usually provides satisfactory information needs of management, but in an unstable socio-economic environment even properly chosen parameters are not guarantees of reliable and relevant information. In addition, differences in methodological approaches and the large number of diverse indicators usually lead to some difficulties and differences in efforts to establish the financial position of the company. The calculations in this case are subjective in nature [19, p. 116].

In the process of monitoring most of the indexes are worked over on the basis of criteria and standards, which use is extremely difficult because many of criterion values within the industry are not formed: “The presence of normative values facilitates the assessment of the company current situation, what is permanent information to determine their competitive position” [20, p. 92]. To convert the primary indexes of the enterprise in their relative values they are compared with baseline (comparison base) ones, which are the average industry, competing businesses indexes or business leader (standard) on the industry segment, as well as indicators
of the same company for periods of its past activity. Herewith “to transfer parameters in relative values it is necessary to use a certain points-scale” [21, p. 48].

Usually even the general picture of formalized enterprise performance is heterogeneous – with some indexes combinations activity effectiveness can be characterized by positive results (comparatively to given in the literature and recommended state standards), by others – on the contrary: “A major disadvantage is the lack of normative values of the most used coefficients and the fact that changes in the dynamics of the coefficient cannot be interpreted properly, because both the numerator and denominator of any coefficient varies in time” [22, s. 138]. Herewith it is necessary to take into account the fact that “any extrapolation model will give reliable results only by constant conditions of the objects functioning that can not but affect both the coefficients of the model and its critical importance” [9, p. 128].

In many studies the attention is focused on the index criteria characteristic, problematic aspects of their installation, proving and justifying the need to develop industry standard and criterion values of meaning characteristics of object certain evaluation. For example, in M. V. Makarenko’ thesis who explores the efficient functioning of engineering companies, it is justified “the need to select the general criterion of the effective enterprise functioning” [13, p. 9].

Effective performance of enterprises in the real economy conditions largely depends on the fact how reliably an overview and shorter perspective of activity conditions and functioning, that is reliability of prediction, based on greater or lesser degree of analysis of the current indexes and activity indicators of the company, are provided. So, for example, quite often the idea is justified that “organizational and methodological basis, formed by the diagnostics results of potential of financial and economic stability is the basis for the formation and choice of sustainable development financial strategy” [23, p. 346].

During the monitoring of heterogeneous informal economic indexes it is necessary to obtain the information, represented concerning the various objects, such as enterprise in a whole and its separate institutions (ratio of the system and part of the system). However, because of the limited information of separate indexes it is necessary to use metrics that allow not only quantitatively to characterize and estimate the situation, but also to reveal its occurrence reasons, as well as to lead structural and logical analysis of factors that influence [24, p. 84]. Thus, we can conclude that the indicative framework of indexes and criteria is complex, and the monitoring is characterized by a multifactor process that has its own characteristics and trends, conditioned by institutional factors.

Therefore in the monitoring system performance activity indexes should be considered through two groups: general business indexes of activity and financial condition; specific indicators which have clearly defined industry (specialized) character. In this combination the factor of informing system: „The best place of taking rates in diagnosed environment is a place (point), where the measure-
ment value gives the highest information” [24, p. 80]. Much of the formation in a unified system of indexes is provided by the standardized forms of financial statement on the basis of which diverse factors are defined. In the modern theory and practice of condition and activity analysis of the enterprise has more than two hundred of comparative analytical indexes, which can be calculated in terms of financial reporting.

The question of various financial ratios use in analytical systems has twofold. On the one hand, to compare the industry, they are considered to be a valuable tool and for individual companies they are described as “... guiding light for the manager in the business world” [4, p. 4], on the other - the coefficient is “... a tool that was mostly over-rated and is most frequently abused” [11, p. 61]. In this regard, U. Brigham noted that “ratio analysis held mechanically and thoughtlessly, is just dangerous, however, on the conditions of its thoughtful application it is able to give a thorough understanding of the company activity” [26, p. 260]. In any case “analysis starts not with the coefficients, but with understanding” [27, s.244], that is financial ratios give only a quantitative expression of what is already obvious.

Quite a simple process of calculation of financial ratios, which also doesn’t require fundamental economic knowledge (usually filed under demonstrative professionalism), the availability of the results of such analysis leads to their widespread use by management systems. By entering coefficient method in the company monitoring system, as a tool of comparative analysis, we must first prevent direct comparison of the so-called recommended meanings (the way of the standards producing is unknown). In this case, both in theory and in application layer clear and categorical conclusion is usually made, that the excess (reduce) of values characterizes the processes of enterprise management resources as wasteful and inefficient ones.

It concerns not only the comparative characteristics of the industry or the economy, but also, based on changing conditions of the overall economic environment, immediate changes dynamic of these coefficient in the enterprise. Using the results of the monitoring system of coefficient method should not be considered the final stage of the analytical process, but mostly by the basis of further diagnostic characteristics of the evaluated object.

Approach of the direct use of coefficient method in the monitoring system, in our opinion, hides the danger of getting of a distorted index (or at least complicated economic interpretation) primarily due to the unsolved question of index selection that really characterize components of future economic effectiveness in today’s complex conditions of enterprise functioning. Nowadays solving of this issue is subjective, that is it is solved by a financial analyst through his view on the importance of an index. This approach is becoming more and more customary for current practice, and that’s why it is naturally considered “a kind of destabilizing factor that only strengthens the subjectivity of the analyst’ opinions, i.e. his ten-
dency to consider a certain parameter main or take into consideration in lesser extent” [19, p. 114].

In modern practice of financial and economic analysis and decision-making on the basis of the results the financial ratios that are connected with the market management mechanisms (financial stability, business activities, etc.), are used. Besides, these financial ratios are the basis for constructing of different prediction models of possible threat or loss of solvency, violation of financial balance or enterprise bankruptcy (Altman’s, Tafler’s, Lis’ models etc.). These models differ substantially by almost all the parameters – the number and content of financial ratios, adjustment values to each of them and therefore by the end result.

In national economic literature there is a number of examples where direct use of foreign models and methods without the necessary adaptation to the peculiarities of the national economy creates distortions of the essence of analytical indexes. From the formal position there is no contradiction between the use of a method of a certain index calculating, but in terms of content there are significant differences between them.

**Conclusions.** In the basis of any analytical and predictive method cost characteristics of assets is put, – one of the most important categories of financial management, management tools which were explored by many famous scientists. Thus the essence of the assets characteristics in the realization of short-term and long-term enterprise tasks in the management models are usually made on the basis of the accounting system (actual cost). Such approaches to asset management are criticized by many prominent financial analysts. As an example, we can cite the statement of the famous national scientist I.O. Blanc, who, noting the specific unsolved problems in the management theory, put need at first of development of “principles of estimation of the real value of total assets”. We follow the position that the introduction of any single or complex (synthetic) parameters, connected with assets estimated by the “historical” value to the monitoring system, leads to the distortion both of financial status characteristics and level of efficiency. Transferring of assets into “format resources,” bringing their value to the current, one can probably consider the main tasks of the initial phase of this subject area monitoring process.

**Bibliography**


10. Пенькова О. Г. Організаційно-методичні засади моніторингу інвестиційної діяльності: дис. … канд. екон. наук: 08.02.03. – організація управління, планування, регулювання економікою / Пенькова Оксана Георгіївна. – Уманський державний педагогічний університет ім. П. Г. Тичини МОН України, 2006. – 216с.


15. Пугачова М. В. Методологічні засади статистичного моніторингу ділової активності підприємств: дис. ... докт. екон. наук: спец. 08.06.01 – статистика / Пугачова Марина Володимирівна. – Державна академія статистики, обліку та аудиту Держкомстату, 2008. – 436с.


17. Малащук Д. В. Конкурентоспроможність машинобудівного комплексу України в умовах глобалізації світових ринків: дис. ... канд. екон. наук: спец. 08.05.01: Світове господарство і міжнародні економічні відносини / Малащук Дмитро Валерійович. – Українська академія зовнішньої торгівлі МОН України. – Київ, 2005. – 206с.


25. Вагин В. Н. Эвристические и вероятностные методы снятия эффективных показателей в системах диагностики / Вагин В. Н., Оськин П. В. // Известия РАН. Теория и системы управления. – 2006. – № 4. – С. 78-93.
