A CRITERIA MODEL FOR ASSESSING THE EFFICIENCY OF THE PRODUCTION MANAGEMENT

Vitaly Zinovchuk¹, Iryna Kopytova²

¹ Prof. habil. Dr Zhytomyr National University of Agriculture and Ecology. Stary Blvd., 7. 10008, Zhytomyr, Ukraine. Phone +380962223742. E-mail zinovchuk@yahoo.com
² Assoc. Prof. Dr Zhytomyr National University of Agriculture and Ecology. Phone +380975005584. E-mail kopytovaira@i.ua

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The evaluation of the production management efficiency is an important component of the management process which forms the reliability of its feedback. In contrast to the evaluation of production efficiency, it is much more difficult to assess the efficiency of management. In this connection, a scientific problem arises: is it possible to apply a system of criteria, ordered and united by a single methodological approach, to evaluate the efficiency of production management? The construction of a criteria model for evaluating the efficiency of the production management will allow objectively and comprehensively to carry out an evaluation measure of management efficiency. For the conduction of the study, certain general scientific and special methods of scientific knowledge were used, both for theoretical generalization and for the purpose of empirical confirmation of the main methodological provisions. The result of the study is a format of the criteria model for assessing the production management efficiency and the justification of its parameters.

Key words: management, management process, decision making, management efficiency, assessment of efficiency, criteria model.

JEL Codes: B49, C51, G14, M11.

1. Introduction

The achievement of a higher level of production efficiency directly depends on the qualitative influence of the management on the production process. Therefore, the organization’s management seeks how to ensure, first of all, its own efficiency, which is determined by external factors, as well as the optimal functioning of all structural elements of management system itself. The assessment of production management efficiency is one such element. It enables the feedback control of the management process and adapts the organization to changes in the external and internal environment.
The choice of criteria and indicators for assessment of production management efficiency is the most critical aspect of this problem. This is confirmed by the experience of the subjects of management at all levels. In particular, within the framework of the conducted survey, 17.7% of employees of local power executive bodies and 13.1% of heads of enterprises and their units confirmed the lack of a well-founded system of criteria for assessing the efficiency of management in their practice. This fact, in turn, generates a one-sided approach and the bias of the mentioned evaluation or even its absence at all.

The complexity of choosing criteria and indicators for evaluating the management efficiency is mainly due to the specifics of management activities those don’t have direct metrics (Ainabiek, 2015; Xiong, 2005; Yarkina, 2014). In this regard, the assessment of the management efficiency is often carried out on the basis of determining the efficiency of object itself but not its management in particularly. However, the equation of the concepts of "management efficiency" and "efficiency of production" is incorrect. An analysis of the managerial practice shows that even when applying an effective management mechanism, it is not always possible to achieve high results and goals set because of force majeure circumstances that cannot be predicted in advance.

The aim of the study is to justify the methodological approach to constructing a criterion model for assessing the efficiency of the production management system, which would allow objectively and comprehensively to implement the assessment of the management efficiency and to ensure the quality of feedback in the management process.

The methodological basis for the research of the production management efficiency assessment, as a complex socio-economic phenomenon, envisaged the use of different approaches, particularly: structural-functional (to analyze the functioning of various components of the management system), system-synergetic (to substantiate the systemic interaction of various management levels), informational and value-based (to assess the performance of the expected results). Within these approaches, after putting forward the hypothesis about the appropriateness of applying a criterion assessment, the critical aspects of the existing management system were identified through the analysis of online sources, statistical materials and primary documents of enterprises, media reports, a review of scientific literature on the problem of management efficiency. The empirical confirmation of certain abstract constructions and the hypothesis was obtained by means of a sociological survey, statistical processing of the received answers, their analysis and generalization. The employees of local departments of the state executive power and bodies of local self-government, heads of enterprises and their subdivisions in Zhytomyr region (Ukraine) were the respondents of the survey. The statistical sample included 250 respondents. The survey was anonymous using a standardized questionnaire containing empirical indicators. In this way, information on the practical experience concerning subjects of evaluation has been collected.
2. Research results and discussion

Currently, the economic science has formed two main approaches to determining the efficiency of production management. The first one is based on simple logic: if production is productive, profitable, then the management system can be assessed as efficient. Another approach to determining the efficiency of production management involves an assessment of the direct contribution of the management to the results of production (Tsui, 1994; Yarkina, 2014).

Each of these approaches has its advantages and disadvantages. The first approach determines the efficiency of production management in terms of the final result, but in this case, the direct contribution of the management system to obtaining this result remains uncertain. Another approach is more objective, but a problem is how to allocate from the general result the contribution of the management system. Therefore, researchers propose to determine the contribution of management to ensuring the production efficiency not by using the general results, but by determining the qualitative impact of namely management on this efficiency (Pawłowski, 2009; Rego, 2017; Tsui, 1994).

The conducted bibliographic review convinces that the theory and practice of management formed an understanding of determining the effectiveness of management based on the result-cost principle (Ainabiek, 2015; Chen, 2015; Zakshevskaya, 2011; Lee, 2013). In this case, the priority is given to so-called "target" efficiency, the highest value of which is characterized by a complete coincidence of the result with the goal set (Yarkina, 2014). But such an approach does not allow the full disclosing the essence of the economic category "efficiency", since it focuses solely on determining the ultimate performance and does not include an evaluation of the management activities through which it has been achieved.

The main means of knowledge about the management process is its modeling, that is, the identification of the main stages and essential characteristics of this process, their reflection in a certain form and the establishment of links between them. Schematically, the process of production management is presented in Figure 1, which allows demonstrating its structural elements in interaction and highlighting the main stages: goal setting, its achievement and feedback.

![Fig. 1. The traditional sequence and the structure of production management process](image-url)
The above provisions allow raising the question of disclosure of the essence of the production management efficiency in two dimensions: 1) the efficiency which is expressed in final results of economic activities (for company management system – in the final results of production) and 2) the management process efficiency. These two dimensions are in a close dialectical relationship, provided that the leading role is strategic efficiency. This conclusion was confirmed empirically by means of a survey, which found that 62.8% of respondents supported the proposed methodology. Because we use “two dimensions” methodological approach, the system of criteria for evaluating the efficiency of production management will also consist of two subsystems: 1) a subsystem of criteria for evaluating the management system by results and objectives; and 2) a subsystem of criteria for evaluating management process that more closely reflects the Figure 2.

The basis of a criteria model for assessing the efficiency the production management system is the assessment by management results and achieved goals set, which are mediated in the indicators of the production final results. It includes three main directions: 1) the assessment of the achieved goals; 2) the assessment of external production efficiency; 3) the assessment of the internal efficiency of production. Another subsystem of the model contains an assessment of the operational efficiency of all structural elements of the management process and their optimal combination. It covers the following directions of assessment: 1) the assessment of the management system organization; 2) the assessment of the production organization; 3) the assessment of the efficiency of the goal-setting phase; 4) the assessment of the efficiency of the managerial influence; 5) the evaluation of the efficiency of the feedback phase. Some criteria of the presented model can act as indicators for the assessment at the highest level of complexity.

The degree of achievement of the set goals is a key feature of an effective management system and its determining characteristic (Yarkina, 2014). This direction of assessment takes into account the target aspect of management efficiency. Therefore, the success of achieving the objectives is proposed to use as a generalized criterion of assessing the effectiveness of the management system in this direction ($K_1$). It characterizes the strategic aspect of management effectiveness. In practice, it is the degree of achievement of the goals set in the plans and programs of production development, is used by 71.2% of the polled managers. Also 31.4% of respondents take into account the number of eliminated deficiencies and solved problems in the current period.

The assessment of the external effectiveness of the object of management is based on the establishment of the completeness of meeting the public needs, which form the goals of production, since the needs are primary in relation to the goals (Leontyev, 2014).
Assessment of efficiency of production management system

The subsystem of criteria for evaluating the efficiency of management by results and goals

- Criterion for assessing the achievement of the goals set
- Generalized criterion for successful achievement of the goals set (K1)
- Criterion of estimation of external efficiency of production
- Generalized criterion of degree of satisfaction of social, group, individual needs and interests (K2)
- Criteria for assessing the internal efficiency of production
- Generalized criterion of the level of production productivity (K3)

Subsystem of criteria for assessing the efficiency of the production management process

- Criteria for assessing the management system organization
- Generalized criterion of the level of organization of the management system (K4)
- Criteria for assessing the production organization
- Generalized criterion of the level of production organization (K5)
- Criteria for assessing the efficiency of the goal-setting phase
- Generalized criterion of the quality level of the accepted managerial decisions (K6)
- Criteria for evaluating the efficiency of managerial influence at the stage of set goals implementation
- Generalized criterion of the level of the management object control (K7)
- Criteria for assessing the efficiency of the feedback phase
- Generalized criterion of the level of completeness and reliability assessment results (K8)

Notes:
K3.1 – level of efficiency of the productive resources use; K3.2 – level of labour productivity; K4.1 – optimality level of the organizational structure of management; K4.2 – level of security of the system of the competent personnel management; K4.3 – organizational level of managerial labour; K5.1 – level of the production structure optimality; K5.2 – level of production potential; K5.3 – level of labour management within the production process; K6.1 – level of efficiency of the decision making mechanism; K6.2 – level of information provision of the management process; K7.1 – level of observance of principles and laws of management; K7.2 – level of operability and quality of management functions implementation; K7.3 – level of efficiency of administrative influence application methods; K7.4 – level of optimality of the management subjects’ functioning style; K8.1 – level of optimality of the evaluation procedure; K8.2 – competence level of the evaluation subject; K8.3 – level of information provision of the management process.

Fig. 2. A criteria model for appraisal of the efficiency of the production management
Consequently, in order to assess the external effectiveness of the management object, it is expedient to use as a criterion the degree of satisfaction of social, group, individual needs and interests \((K2)\). It gives an opportunity to evaluate the degree of interest of certain consumer groups, business entities and society as a whole in the functioning and development of a particular production. It is intended to target the management system to the needs and problems of society, and to reflect the degree of their resolution. In practice, this direction of evaluating the efficiency of management is carried out on the basis of continuous monitoring of market share, which was indicated by 67.1\% of respondents.

The internal effectiveness shows how the satisfaction of certain social needs is reflected in the dynamics of achieving its own goals of the socio-economic system and its individual groups of participants (Chen, 2015; Lee, 2013; Yarkina, 2014). The basis of the internal efficiency of the control object is formed by the production results (used by 92.3\% of the surveyed management subjects), as well as the level of use of its production potential (used by 59.4\% of respondents). In this regard, in order to assess the internal efficiency of a management object, it is proposed to use the generalized criterion of production efficiency \((K3)\), which is formed on the basis of: a) the level of efficiency of the productive resources use; b) the level of labour productivity.

Ensuring a high level of efficiency of the management process is possible only if it is achieved at each stage: at goal-setting (making management decisions), at the stage of achieving the goals and at the feedback stage (Kapelushyna, 2016; Yarkina, 2014). The effectiveness of the management process depends on its direct participants (the object and subject of management), their internal organization, potential capabilities and direct actions. The optimal functioning of all structural elements of the management process, as one of the determining factors of management efficiency, has been noted by 23.1\% of respondents. That’s why the subsystem for assessing the efficiency of the management process should include an assessment of the process each stage, as well as an assessment of the management system organization and production itself.

An assessment of the organizational level of the management system can determine its ability to meet the needs of the business environment. Production management must adequately respond to environmental signals in relation to public needs and achieve their goals. The assessment of the management organization should be characterized by criteria that most fully determine its internal structure and reflect its essence. These include: a) the optimality level of the organizational structure of management; b) the level of security of the system of the competent personnel management; c) the organizational level of managerial labour. These criteria are generalized by the level of management system organization \((K4)\). Importantly, evaluating the effectiveness of management, 45.5\% of respondents take into account the level of the management system organization.

It is impossible to achieve a higher level of management efficiency if the management object is not well organized. In this regard, the organizational level of
the management object (the production system as a participant in the management process) should be evaluated by analogy with the assessment of the organizational level of the management system according to the following criteria: a) the level of the production structure optimality; b) the level of production potential; c) the level of labour management within the production process. The level of production organization is a generalized criterion for assessing the organization of the management object in relation to the above presented criteria (\(K5\)). This is supported by management practice, particularly 51.3\% of managers use this criterion, and 20.5\% of them take into account the number of failures in the functioning of the management object due to errors in its organization.

The goal-setting phase is very important for the management process, because the mission, strategy, tactics, goals and objectives of the operation and development of the control object are developed. The goal-setting process is relatively independent, which determines the peculiarities of its evaluation. Like any economic process, the stage of goal-setting generates its own results and has its own implementation mechanism (Opeshko, 2017). Therefore, the main criteria for assessing its effectiveness are: a) the level of efficiency of the decision making mechanism; b) the level of information provision of the management process; c) the level of observance of principles and laws of management. The level of decisions taken quality (\(K6\)) is generalizable in relation to other criteria of this group. The majority (67.1\%) of the polled managers pointed out its importance, and 74.4\% of respondents consider the number of implemented ideas that brought positive results.

The management process is considered to be started after the transfer of the decision by the management subject and its perception by the object of management. If this command is not accepted, the management process cannot pass the complete cycle. Therefore, to achieve the efficiency of the management process, first of all, it is necessary to ensure the manageability of the object, without which it is impossible to implement management decisions. It is provided by the subject through the managerial influence on the management object on the basis of the scientific principles observance, implementation of managerial functions, through the optimal use of forms, methods, levers and instruments of managerial influence (Rao, 2007; Rego, 2017). Management influence is primarily mediated through the management mechanism. The subsystem of criteria and indicators for evaluating its efficiency should be based on the evaluation of each its element (Kapelushyna, 2016).

The efficiency of managerial influence at the stage of attaining the set goals should be evaluated, in our opinion, according to the following criteria: a) the level of observance of principles and laws of management; b) the level of operability and quality of management functions implementation; c) the level of efficiency of administrative influence application methods; d) the level of optimality of the management subjects’ functioning style. At the same time, the effectiveness of the management mechanism, first of all, is manifested in the level of the management object control (\(K7\)), which is determined by the results of achieving the goals, and
therefore is generalizing with respect to other criteria of this group. The high level of ruling the object of management provides the most complete and qualitative achievement of the set goals, which will be confirmed by such indicators as high final production results.

The quality of the feedback in the management process considerably depends on the quality of the information transmitted through the communicative network of the socio-economic system, and on the system for evaluating this process results. Unfortunately, in evaluative practice, the feedback quality according to the survey is taken into account only by 28.2% of managers, and its importance, as an important factor in determining the efficiency of management, is understood only by 17.9% of respondents. The effectiveness of the feedback phase can be determined on the basis of the following criteria: a) the level of optimality of the evaluation procedure; b) the competence level of the evaluation subject; c) the level of information provision of the management process. The level of completeness and reliability of the achieved results assessment \((K8)\) can be the generalized criterion for the listed in this group. It allows us to determine how far the feedback provides performance of the functions of assessing the effectiveness of management.

The extraordinary complexity of calculating such models complicates their application in practice and increases the cost of evaluation. In this regard, minimizing their constituent elements and the relative simplicity of the calculation should become an important requirement for economic and mathematical models of production management efficiency. This requirement can be met by using the generalized criteria proposed for assessing the effectiveness of management.

3. Conclusions

1. As a result of the theoretical search and empirical confirmation of its results, it has been established that an adequate system of its assessment is needed to ensure the effectiveness of the production management system. The results of production management are not so obvious and, as a rule, are not directly evaluated as the results of the production itself. Therefore, for their system evaluation it is advisable to apply a criterion model based on a two-dimensional and indirect methodological approach. It should have a generalized, unified format and define the principle of constructing modified subsystems of indicators and relevant indexes.

2. The conceptual basis for the content and forms of assessing the production management efficiency is its definition in two dimensions: 1) the efficiency, expressed in its final results (strategic efficiency) which has a leading role and 2) the efficiency of the management process (tactical efficiency). This approach allows assessing not only the effectiveness of management, but also the means by which this performance has been achieved.

3. Each subsystem involves the use of appropriate assessment criteria grouped in specific areas of evaluation. Each of the directions has a certain generalized criterion. The empirical verification of the evaluation criteria revealed the basis for
the correction and strengthening of individual components of the model, which are often underestimated in practice. In this way, the proposed criterion model acquires a comprehensive coverage and a systematic approach to assessing the efficiency of production management.

4. The proposed criteria model for assessing the production management system efficiency can serve as a methodological basis for the further development of economic and mathematical modeling. Taking into consideration the complexity of the management efficiency as a socio-economic phenomenon, its models must be objectively multicompont (multicriteria).

References


GAMYBOS VALDYMOS VEIKSMINGUMO VERTINIMO KRITERINIS MODELIS

Vitaly Zinovchuk, Iryna Kopytova
Žytomiro nacionalinis agroekologinis universitetas

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Santrauka


Raktiniai žodžiai: vadyba, valdymo procesas, sprendimų priėmimas, valdymo efektyvumas, efektyvumo įvertinimas, kriterijų modelis.

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