

DOI 10.31558/2307-2296.2018.1.19

UDC 657.05

*Tomchuk O.F.*, Candidate of Economic Sciences, Associate Professor of the Department of Analysis and Statistics Vinnytsia National Agrarian University

*Tomchuk V.V.*, Candidate of Economic Sciences, Associate Professor Department of Accounting, Analysis and Audit Vasyl' Stus Donetsk National University

## THE ROLE OF THE ANALYTICAL SYSTEM IN THE INFORMATION SUPPORT OF THE ENTERPRISE MANAGEMENT

The article considers the essence of the analytical system, its methodological basis, principles of economic analysis and outlines the content of administrative and financial analysis. The indicated subsystems of management define areas and data required for the formation of analytical information, as it is mainly used in several subsystems and at different levels of the enterprise management. It is investigated that the analytical system of the agricultural enterprise is not constant in time and space, and it undergoes constant changes in response to the changes in techniques and technologies for obtaining and processing information, managers' needs for the management information.

Analytical system is a form of organization of various types of analysis and it is organized in order to provide external and internal consumers with the information sufficient for the adoption of effective managerial decisions. Components of the analytical system are targeted at meeting certain needs of the management system of the processes of innovative development of enterprises, depending on the scope of innovation and the manifestation of the effect of this implementation.

**Key words:** analytical system, informational support, economic analysis, management analysis, financial analysis, analysis of innovation activity.

Fig. 2, Ref. 15

*Томчук О.Ф., Томчук В.В.*

## РОЛЬ АНАЛИТИЧЕСКОЙ СИСТЕМЫ В ИНФОРМАЦИОННОМ ОБЕСПЕЧЕНИИ УПРАВЛЕНИЯ ПРЕДПРИЯТИЕМ

В статье рассматривается сущность аналитической системы, ее методологические основы, принципы экономического анализа, определено содержание управленческого и финансового анализа. Указанные подсистемы управления определяют области и данные, необходимые для формирования аналитической информации, поскольку используется она в нескольких подсистемах и на разных уровнях управления предприятием. Исследовано, что аналитическая система является формой организации разных видов анализа и организована с целью предоставления внешним и внутренним пользователям информации, достаточной для принятия эффективных управленческих решений.

**Ключевые слова:** аналитическая система, информационное обеспечение, экономический анализ, управленческий анализ, финансовый анализ, инновационный анализ.

Томчук О.Ф., Томчук В.В.

## РОЛЬ АНАЛІТИЧНОЇ СИСТЕМИ В ІНФОРМАЦІЙНОМУ ЗАБЕЗПЕЧЕННІ УПРАВЛІННЯ ПІДПРИЄМСТВОМ

У статті розглянуто сутність аналітичної системи, її методологічну базу, принципи економічного аналізу, окреслено зміст управлінського та фінансового аналізу. Означені підсистеми управління означають ті сфери, де та на базі яких даних формується аналітична інформація, так як використовується вона, як правило, у декількох підсистемах та на різних рівнях управління підприємством. Досліджено, що аналітична система є формою організації різних видів аналізу і організовується з метою забезпечення зовнішніх і внутрішніх споживачів інформацією, достатньою для ухвалення ефективних управлінських рішень.

**Ключові слова:** аналітична система, інформаційне забезпечення, економічний аналіз, управлінський аналіз, фінансовий аналіз, інноваційний аналіз.

**Setting of the Problem.** In modern conditions, the business environment is undergoing rapid changes in the economic situation, which introduces new requirements for the enterprise management system in order to respond to the challenges quickly and adequately. Analytical system of the enterprise is an important organizational stage of the business entity operation.

It is very important to conduct analytical processing of information on the basis of a systematic approach, which enables to reveal the complexity of the object, multifaceted relationships and unite them into a single integral system. The systematic approach defines the main objectives of the system, the achievement of which should be facilitated by the source data and the obtained effective information. The system is constructed in accordance with the purposes. In this case, the system can be defined as a set of elements and information links that arise between them and which provide optimal safe management of the economy of agricultural enterprises. Such a system should provide users with all the necessary information, and thereby create conditions for the management personnel for the integrated enterprise performance assessment and making reasoned decisions. Existence of the gap in time between the moment of obtaining analytical information and the moment of its use for the adoption of operational, tactical and strategic decisions complicates the problem of ensuring the efficiency of agricultural enterprises through the control factor. Therefore, the role of modern systems of the information and analytical support of economic activity, which enable to solve existing problems of development, is growing.

**Overview of recent research and publications.** In recent years, the term “analytical system” has been used more often both in the scientific works and dissertations of domestic and foreign scientists. A significant contribution to the research of the analytical system as a component of the information and analytical support of the process of managing the activities of business entities was made by such domestic scientists as N.D. Hlazko [1], Y.I. Mulik [2], O.L. Podolianchuk [3], V.K. Savchuk [4] and other scholars. Foreign scientists, in particular V.V. Kovaliov [5], H.V. Savytska [6], A.D. Sheremet [7] have made a significant contribution to solving problems of functioning and organization of the analytical system of the enterprise.

Despite the significant contributions to the development of conception of the analytical system made by domestic and foreign scientists, the problems of development of a holistic (integrated) analytical system require further research.

**Objectives.** The purpose of this research is to study methodological aspects of forming a holistic analytical system in order to increase the effectiveness of using its information for the adoption of sound managerial decisions.

**Research materials.** No managerial decision is made without proper analytical support. Analysis is a philosophy of the substantiation of managerial decisions, a definite logically verified approach to a control system, in which formalized and non-formalized methods should be harmoniously combined [8, p. 15]. According to V.K. Savchuk, the main function of analysis is “justification of managerial decisions” [4, p. 295]. The subsystem of analytical support of the economic activity management becomes a constantly operating factor of growth of production efficiency at the expense of activation of the enterprise’s information fund.

It is possible to agree with the opinions of V.V. Kovaliev [5, p. 28], H.V. Savytska [6, p. 19], A.D. Sheremet [7, p. 17] and other authors who believe that the analytical system provides a quantitative and qualitative assessment of changes occurring in the managed object. It enables to predict trends in the development of both undesirable and progressive phenomena. Based on different methods of analysis, options of managerial decisions are developed, which assists in slowing down the development of negative tendencies and creates favorable conditions for progressive and sustainable development. The analysis reveals unused internal reserves, which enables to accelerate the processes of innovative transformation and development of the enterprise [9, p. 194]. Consequently, the analytical system is the basis for the development of optimal managerial decisions for managing transformational processes and development.

Methodological basis of the analytical system of the agricultural enterprise is the economic analysis, which is a systematic set of analytical procedures aimed at obtaining conclusions and economic recommendations concerning a particular object (country, market, enterprise, project, cost, price, etc.). In a broad sense, economic analysis can be treated as the analysis in the economy, as a combination of relations arising in the process of holding, sharing, distributing and consuming goods [5, p. 31]. Economic analysis combines many types and approaches selected according to different criteria. Until now, there is no single approach to the structuring and classification of economic analysis.

Economic analysis of the enterprise leads to drawing conclusions about:

- objectivity of the enterprise's self-assessment;
- objectivity of the enterprise's assessment of its competitors;
- adequacy of identification of the enterprise’s priorities concerning the development

strategy.

Economic analysis of the enterprise should be based on the following principles:

- the system approach, according to which an enterprise is considered as a complex system operating in the environment of open systems and, in its turn, consists of a number of subsystems;

- the principle of complex analysis of all components of subsystems, elements of the enterprise;

- the principle of dynamism;

- the principle of consideration of the enterprise specifics (sectoral and regional) [10, p. 43].

The totality of analytical procedures in the system of macro- and microeconomics is called macroeconomic and microeconomic analysis, respectively. The core of microeconomics is the behavior of the enterprise as the main economic unit, therefore is it appropriate to separate the analysis of the enterprise's economy or economic activity of the

enterprise, the essence of which, as noted by V.K. Savchuk, “is manifested through its principles, functions, role in management and its task” [4, p. 293]. In its turn, it is subdivided into the analysis of financial-and-economic activity of the enterprise and the technical-and-economic analysis [5, p. 33].

The technical and economic analysis is a generalized description of analytical procedures aimed at improving the organization and management of the enterprise in general, which results are not necessarily expressed in terms of efficiency being of interest primarily to line managers and not intended for external users (for example, analysis of organizational structure, corporate traffic flows, labor organization, organization of the system of the resource support of units, level of scientific-and-technological advance, etc.) [5, p. 34].

Analysis of financial-and-economic activity by the criterion of the information base used is subdivided by some authors [5, p. 35; 6, p. 18; 7, p. 21] into financial analysis (external) and management (internal) analysis.

Management (internal) analysis is the analysis in the overall system of managerial accounting and financial management conducted from the standpoint of individuals who have access to any information resources that circulate within the enterprise. Management analysis is mainly considered to be a management accounting as a set of analytical procedures aimed at optimizing the cost management system [6, 7]. However, a number of scholars [11, p. 86; 4, p. 297] believe that management analysis is the economic analysis that is adapted to the goals and objectives of a particular enterprise that covers managerial problems. Consequently, it performs much wider analytical objectives than optimization of the enterprise cost management and it is a separate approach of the economy analysis, and not only the analysis of financial and economic activity.

Financial analysis is the analysis in the system of financial management conducted from the standpoint of external users who do not have access to internal information, where available financial statements are the basis of the information base [8, p. 46]. At the same time, various scientific schools define financial analysis both in the narrowest sense, i.e. as the analysis of financial statements, and the broadest sense, which covers all aspects of the financial management system (investment analysis, business valuation, analysis of financial markets, etc.) [12, p. 81].

The development of financial analysis in Ukraine intensified in the XVIII century with the strengthening of analytical and controlling functions of state controllers on the compliance with the magistrate budget [13, p. 235].

According to the authors, while the financial analysis can be both internal and external, the management analysis can be only internal. The features of the management analysis are the appointment of results for enterprise managers; application of all available sources of information to conduct analysis; lack of external regulation of the analysis methodology; complexity of analysis; study of all aspects of the enterprise activity; integration of accounting, analysis and decision making; closure of analysis results in order to preserve commercial secrets.

In the system of economic analysis of the agricultural enterprise there can be also distinguishes such separate areas as investment analysis, strategic analysis, marketing analysis, logistics analysis, etc. Consequently, the analytical system of the enterprise can be represented as follows (Fig. 1).

In practice, all of the given areas of economic analysis of the enterprise are closely interrelated using a common information base, methods and techniques of analysis, although each one has its own specific features and purpose, which complicates the classification problem. These control subsystems are also conditional and refer to the areas, in which and

on the basis of which the analytical information is formed, as it is usually used, as a rule, in several subsystems and at different levels of the enterprise management.

According to Fig. 1, such approach of economic analysis as “innovative analysis” or “analysis of innovation development” has not been identified in the contemporary scientific works. However, due to the fact that innovation projects, innovation processes and innovation activities are the basis of innovative development, they often become the object of analysis within the framework of investment analysis (analysis of investment projects), as any innovative projects are a priori investment.

Analysis of innovation activities (by financial indicators, in particular, acquisition and creation of intangible assets, etc.) is carried out in the framework of financial analysis.

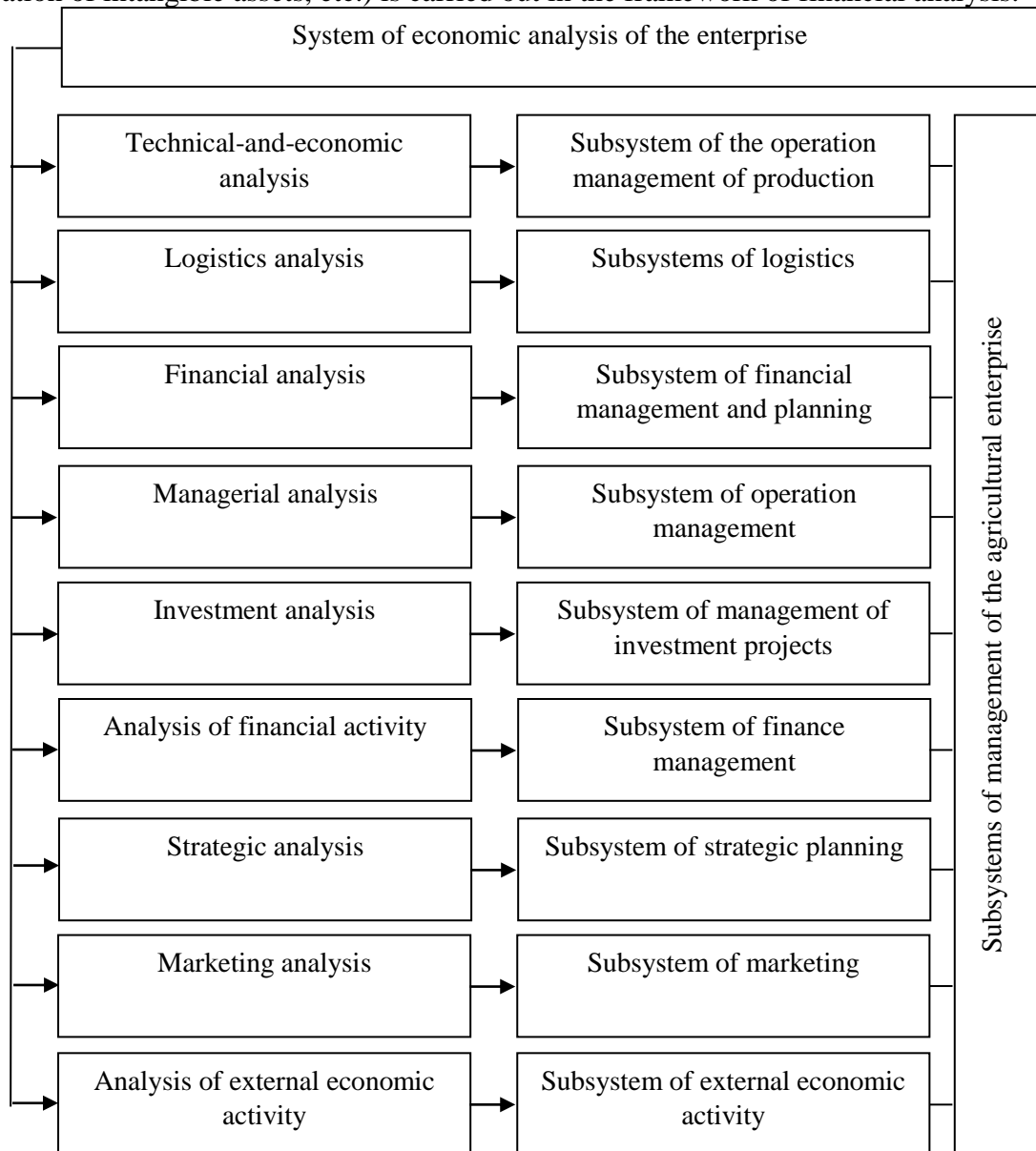


Fig. 1. Structure of the analytical system of the enterprise by the types of management activity (fragment)

Source: developed by the authors according to Voloshchuk [12, p. 33]

Justification of the choice and analysis of innovation strategies (strategies for innovation development) is carried out within the framework of strategic analysis.

All of these components of the analytical system are targeted at meeting certain needs of the system of managing the processes of innovation development of enterprises depending on the scope of innovation implementation and manifestation of the effect from this introduction. However, in our opinion, the importance of innovative development processes in the activities of modern agricultural enterprises requires the identification of its components as objects of analysis within a certain area of economic analysis.

From the methodological point of view, financial analysis, in particular, the analysis of financial statements is the most simple and accessible to any user. The data of financial analysis provide information of the financial condition of the enterprise and its dynamics, allow us to identify key problems of financial management and, thereby, preconditions for the activation of innovation processes and innovation activity as well as provide information on the results of innovation development through analysis of the dynamics of key indicators of evaluation of financial status and performance of the enterprises activity.

One of the key features of financial analysis is its basing on the financial reporting and accounting data, but financial analysis should not be identified with the analysis of financial statements only. Indeed, classical methods of financial analysis [12, 14] primarily consider the systems of financial indicators based on these forms of financial statements of the enterprise. This is the so-called “first level” of financial analysis. However, further, if the financial analysis is conducted by internal analysts in the interests of the internal financial management system, these techniques are deepened to a detailed analysis of “problem” reporting items based on the data of accounting. Here, financial analysis intersects with technical, economic, and other areas of analysis in terms of methods, models and analytical data used. However, its key feature is the use of financial data (in monetary terms) as analytical data. Consequently, financial analysis by the criterion of specification can be considered at two levels (namely, levels, not areas): 1) analysis of financial statements or the first level of financial analysis; 2) in-depth financial analysis according to the data of accounting (Fig. 2).

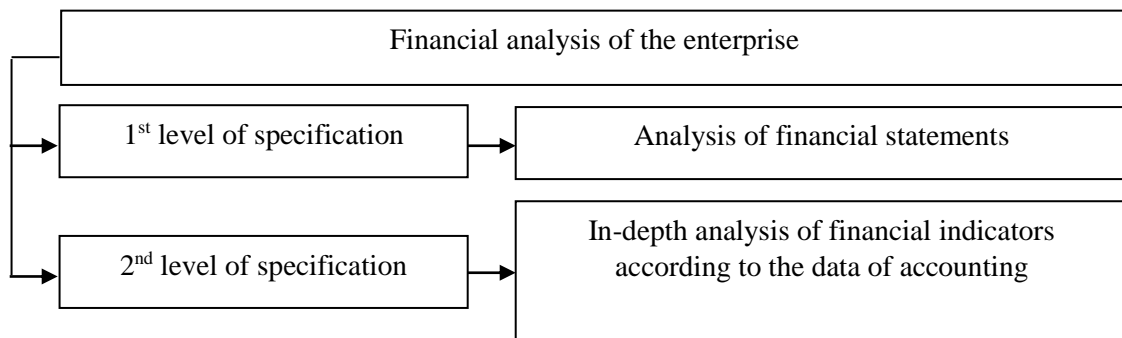


Fig. 2. Levels of financial analysis of the enterprise

Source: developed by the authors according to Shkolnik et al [14, p. 76]

The subject of financial analysis is financial relations in the system of management of the economic entity, its economic potential and results of use, and therefore it contains four basic elements: financial relations, resources, sources of financing and results of the use of economic potential [5, p. 87].

Financial analysis is an integral part of financial management and audit, the results of which serve as the basis for making the best decisions in the field of financial and economic activity of the enterprise.

According to Shkolnik et al. [14, p. 13], financial analysis is a set of analytical procedures, usually based on generally available financial information and designed to assess the state and effectiveness of using economic potential of the enterprise, as well as making managerial decisions regarding the optimization of its activities or participation in it. In this way, financial analysis is the basis of financial management, an integral part of the effective management system [12, p. 35].

Analysis of financial statements is a process of research and methodology for estimation of current and future financial condition and main results of financial and economic activity of the enterprise on the basis of the study of dependence and dynamics of indicators of financial reporting in order to increase its market cost and ensure effective development.

The main features of the analysis of financial statements include the dominant of monetary unit in the system of criteria; provision of the general characteristics of the property and financial condition of the enterprise; priority of ratings of solvency, financial stability, profitability; grounding on public information; accessibility to the results of analysis of any users; possibility of unification of the composition and content of settlement-and-analytical procedures; high probability (within the probability of reporting).

The essence of financial analysis is to determine the key parameters that give an objective assessment of the financial condition of the enterprise (profits and losses, condition and structure of the assets and liabilities, settlements with debtors and creditors, liquidity, stability, etc.) taking into account the dynamics of its changes by the results of economic activity of the enterprise over the analyzed period in order to identify “bottlenecks” and factors that have influenced these changes, to forecast the future financial state of the enterprise (for the nearest and furthest perspective), and to develop measures aimed to improve the organization of finance and increase the efficiency of their use.

Thus, the main objective of financial analysis is to assess and identify the internal problems of the enterprise for making, justification and adoption of managerial decisions [12] related to the following principal areas of its activities: 1) investment activity (where to invest, or not to change the structure of assets, what should be the insurance stock of the current assets, or an optimal portfolio of financial investments, etc.); 2) search and optimization of sources of financing (whether the structure of sources is optimal, whether the enterprise can maintain the structure of current liabilities, which financial instruments are better for the mobilization of additional sources); 3) current activities (what are the main trends in the development of the enterprise, what about its liquidity and solvency, whether current assets provide smooth production flow, whether policy of the enterprise is optimal regarding its debtors and creditors, etc.).

Financial analysis is based on the calculation of relative indicators that characterize various aspects of the enterprise and its financial position. The determined indicators, first of all, give an opportunity to see the changes in the financial position and performance and help to determine the trends and structure of such changes, which, in their turn, can point the company's leadership to the threats and opportunities that are inherent in the company. The stage of analytical procedures should be followed by the adoption of a management decision.

Traditionally, analysis of the enterprise's activities based on its financial statements has been conducted in the following areas [14, p. 16]: 1) analysis of property and sources of its formation; 2) analysis of liquidity of the balance sheet, liquidity and solvency of the enterprise; 3) analysis of financial sustainability and type of financial situation; 4) analysis of the rate of rotation of assets and capital (business activity); 5) analysis of financial results and profitability.

From our point of view, financial analysis provides an opportunity to assess: 1) the property status of the enterprise; 2) the degree of entrepreneurial risk; 3) capital adequacy for current activities and long-term investments; 4) the need for additional funding sources; 5) capability to increase capital; 6) rationality of attraction of borrowed funds; 7) the level of efficiency of activity and use of capital; 8) justification of the policy of distribution and profit application.

Methods of financial analysis are examined in details in many sources, in particular [7, p. 88; 12, p. 36; 14, p. 63; 15, p. 55]. The assessment of the financial condition of the agricultural enterprise is carried out in terms of the following groups:

I. Indicators of dynamics of the enterprise development.

II Indicators of the structure of assets and liabilities.

III. Indicators of liquidity.

IV. Indicators of financial sustainability.

V. Indicators of business activity.

VI. Indicators of profitability.

The techniques and indicators used are closely related to the structure of financial reporting, reporting rules. A significant complication is that that from 2000 till now the financial statements of domestic enterprises has been changing from time to time, the Accounting Standards and the articles of financial reporting have been amended, which requires appropriate changes in methodologies for calculation of financial indicators. Changes in financial reporting also cause difficulties when comparing financial ratios over several periods.

The research of classical and most common systems of indicators of financial analysis (analysis of financial statements) allows us to conclude that they are insufficient for the analysis of innovative development of the enterprise. In fact, the analysis of financial statements can post-factum identify availability or lack of development (as a result of what is displayed in the financial indicators) on the basis of at least the dynamics of property value, income, financial performance, but it is almost impossible to identify the influence of innovation processes on this development, that is, the extent of its innovation capacity. In addition, innovative processes (on their first stages) often lead to a short-term deterioration of the indicators of financial condition, therefore, while activating the innovation activity of the enterprise (which is an indispensable feature of innovation development), the indicators of the financial condition will indicate the opposite.

Consequently, key components of innovation development, such as innovative activity and innovative potential of the enterprise as well as qualitative changes in its status, cannot be fully displayed by the financial analysis tools according to the financial statements.

At the same time, financial analysis (analysis of financial statements), known as a system of financial indicators of property status, liquidity, financial stability, turnover and efficiency, is the only area of economic analysis fully secured by accounting, since standardized financial reporting is an obligatory element of accounting for all enterprises.

We believe that the main analytical tools in the management of innovative development of the enterprise should include: 1) the methodology and system of indicators for assessing qualitative changes in the state of the enterprise according to the financial statements; 2) methodology and system of indicators of evaluation of innovation activity; 3) the methodology and system of indicators for assessing innovation potential.

N.D. Hlazko emphasizes that the role of analytical procedures is intensifying with the development of the latest technologies (modernization of processes and equipment), changes in the spheres of public life, growth of competition and possession of the zones of influence,



while analysts have a significant impact every day and may affect subsequent events [1, p. 185].

In our opinion, the processes for obtaining, storing, processing and transmitting information are important for the analyst-manager because of the following reasons:

- information-and-analytical activity allows to collect data into a coherent picture of what is happening, and to predict the effect of various factors, structures, groups of interests;
- analytical system provides information to all stages of the management cycle, preparation, managerial decisions and control over their implementation.

O.A. Podolianchuk argues that the quality of analytical information required for making managerial decisions is manifested through the criteria - requirements for it:

- timeliness;
- accuracy;
- comparability;
- completeness (sufficiency);
- usefulness (expediency);
- accessibility;
- profitability;
- targeting;
- adequacy;
- adaptability [3, p. 56].

Despite the lack of the identified methods as the grouped systems of indicators in the available methodical tools of financial analysis (analysis of financial statements), some of the features of innovative activity and innovative potential are displayed in the financial and statistical reporting of the enterprise, some – in management reporting. To form indicated methods of the innovation development analysis, a more detailed study of the essence of components of innovative development as objects of accounting and analysis, current accounting and analytical support are required.

Therefore, information support of the enterprise management should be based on the adequate analytical system, which is a set of accounting information and analytical data obtained on its basis, which facilitate the adoption of managerial decisions at macro and micro levels.

**Conclusions.** Analytical system of the enterprise is the basis for the making optimal managerial decisions for managing transformational processes and development. Components of the analytical system are targeted at meeting certain needs of the management system of the processes of innovative development of enterprises, depending on the scope of innovation and the manifestation of the effect of this implementation.

Solving the tasks of the system of analytical support for management of innovative development of the enterprise requires solving of existing methodological problems in the system of economic analysis, where till now the definitive analytical tool for assessing the innovation development of enterprises is not yet complete.

The specificity of management of innovation processes, innovation activity and development must be reflected in all components of the system of analytical support for management of innovative development of the enterprise through the formation of analytical tools for evaluating qualitative changes in the state of the enterprise as a result of innovation development, assessment of innovation activity, innovation potential and the allocation of such a direction of analysis as “innovative analysis” or “analysis of innovation development”.

Analytical system of the agricultural enterprise is not constant in time and space, and it undergoes constant changes in response to the changes in techniques and technologies for

obtaining and processing information, managers' needs for the management information. Hence, there is a close feedback between the analytical system and the managers (enterprises and external users).

#### References:

1. Hlazko N.D. Significance of the analyst's profession in the labor market of Ukraine / N.D. Hlazko // *Ekonomika. Finansy. Menedzhment: aktualni pytannia nauky i praktyky*. – 2017. – № 6. – P. 184-196.
2. Mulyk Y.I. Formation of the system of accounting and analytical provision of financial security of enterprises in the conditions of agrarian business. [Internet resources]. – Available from: <http://journals.nubip.edu.ua/index.php/Economica/article/viewFile/4914/4841>
3. Podolianchuk O.A. The essence of accounting and analytical information and its role in the control system of the agricultural enterprise / Podolianchuk O.A. // *Ekonomika APK*. – 2010. – № 3. – P. 54 – 57.
4. Savchuk V.K. Genesis of information-analytical control system // *Bukhhalterskyi oblik, kontrol i analiz u suchasni ekonomichni nautsi ta praktytsi: zb. materialiv III Mizhnar. nauk.-prakt. konf., 3-4 kvitnia 2014 r. : prysviach. 70-richchiu kaf. obliku pidpriemnytskoi diialnosti* / [Ed.: V. I. Yefimenko et al.];– Kyiv : KNEU, 2014. – P. 293-297. <http://ir.kneu.edu.ua:8080/handle/2010/6618>.
5. Kovalev V.V. *Financial analysis: methods and procedures: manual*. – M.: Fynansy y statystyka, 2005. – 560 p.
6. Savytska H.V. *Economic analysis of the enterprise: [manual]* / H.V. Savytska. – K.: Znannia, 2004. – 654 p.
7. *Methodology of financial analysis of the activities of commercial organizations: manual* / A.D. Sheremet . – 2-e yzd., pererab. y dop. – M.: NYTs Ynfra-M, 2013. – 208 p.
8. Mnykh Ye.V. *Economic analysis: textbook*. – K.: Znannia, 2011. – 630 p.
9. Budko O. Formuvannia tsilisnoi oblikovo-analitychnoi systemy subiektiv hospodariuvannia // *Ekonomichnyi analiz*. – 2013 . – Issue 12, Part 4 . – P. 192-196.
10. Kozachenko H. V. *Management costs of the enterprise: [monograph]* / Kozachenko H.V., Pohoreloe Yu. S., Makukhin H. A . – K. : Libra, 2007. – 320 p.
11. Kindratska H.I. *Economic analysis: textbook* / H.I. Kindratska, M.S. Bilyk, A.H. Zahorodnii. – Lviv: «Mahnoliia 2006», 2008. – 440 p.
12. Voloshchuk L.O. *Financial Analysis: A Study Guide* / L.A. Voloshchuk, M.A. Yudyn; pod red. Fylyppovoi S.V. / – K.: KAFEDRA, 2012. – 320 p.
13. Fedoryshyna L.I. *Origins of economic analysis* / L.I. Fedoryshyna // *Prychornomorski ekonomichni studii* . – 2016 . – Vypusk 11. – P. 234-238.
14. *Financial analysis: manual* / Za zah. red. Shkolnyk I.O. [I.O. Shkolnyk, I.M. Boiarko, O.V. Deineka ta inshi] . – K.: «Tsentri uchbovoi literatury», 2016. – 368 p.
15. Bilyk M.D. *Financial Analysis: manual* / M.D. Bilyk, O.V. Pavlovska, N.M. Prytuliak, N.Iu. Nevmerzhytska / – K.: KNEU, 2005. – 592 p.