

Premises and Feature of the Informatics Achievement of Informational Subsystem of Economic Analysis

Tudor LEAHU, Alexandr GRECU, Victor MORARI
Free International University of Moldova, Chişinău, Republic of Moldova
leahu.ts@mail.ru, vmorari@ulim.md, agrecu@ulim.md

Functional value, role and place of the informational sub-system of economic analysis, contributing factors to its accomplishment, evolution, current situation and prospects of this achievement are highlighted and characterized. It is approached the unitary concept of achievement a such examined sub-system within the integrated management system of the organizational unit. The particularities and principles of the establishment of the informatics subsystem of economic analysis are formulated.

Keywords: *Economic Analysis Information Subsystem, Particularities, Principles, Constitution, Economic Analysis Informatics Subsystem, Integrated Management System*

DOI: 10.24818/issn14531305/25.2.2021.01

1 Introduction

In general aspect, any management system is realized and evolves thanks to the interconnected and interacted nature of the certain composition and number of functions. According to this approach, the integrated unitary system of economic management, which virtually incorporates in itself in strict and direct interconnection and interaction all the material and informational processes that form the organizational unit, the analysis activities forms a special management function.

From organizational positions, all information, which appears and is processed in the environment of such a function, forms an information sub-system, characteristic of its content. Therefore, any management function requires the formation of a particular information sub-system. From here - it becomes clear that the composition of information sub-systems is equivalent to the composition of the functions of the management system. Not is the system of management of economic material activities an exception in this respect. Therefore, thanks to the predestined purpose and different functional content, the information circulating during the performance of the analysis function objective led to its organization as a sub-system.

Both in the case where human material and spiritual processes are barely initiated to be

effectuated and, in the case, when they already operate, this sub-system is preceded by the sub-systems of rate-setting and settlement, foreseeing, evidence and financial administration. For this reason, for economic analysis all these sub-systems have an informative role, just as the values of their information units, in common with the respective values of other sub-systems, constitute its informational basis. This situation explains and justifies the fact that the sub-system of economic analysis is realized in the last place, i.e., subsequently the previously nominated sub-systems [1, 81-83; 2, 44-71; 8, 33-38].

Such specifics put their mark on those resources and the concept of the it-making of the elucidated sub-system. In this respect, it is necessary to stress that virtually all the values of the information units, on the basis of which the economic analysis is carried out, are of a derivative nature. Because of the given, the information base expressly contains totals of resulting and intermediate indicators, which were obtained in its previous sub-systems.

At the same time, it is not excluded that in some extremely rare situations, informational units with primary values are also used, but also in this version, they have been introduced into informatics memory, because without them it is impossible to obtain the resulting values. So, regardless of the level of informatics achievement (mechanized,

automatized, automatic), the information background of the economic analysis function can be easily reorganized and oriented towards its processing and formulating in this basis the timely decisions. Moreover, when the informatics system of the material object (process) is fully realized, the economic analysis activities are carried out in the form of a separate informatics sub-system. Despite the existence of favorable conditions and contributory premises of the other informatic resources, in the plan of involvement, currently economic analysis activities are at the lowest level of informatics achievement. The practice and theory of elaboration are limited only by the control stage, the analysis itself being left to the competence of the end user, more concretely, dependent on his qualification.

It should also be considered that economic analysis can occur practically in relation to any object and process of any spatial and temporal radius, which increases its degree of complexity, thus becoming much more voluminous and structurally composed, compared to the previous informational sub-systems and successors to economic material activities. The ongoing situation may also be complicated because any categories of information (technical, social, geographical, etc.) may also be used for analysis purposes.

It is known that any technology is limited to determining the manner and succession of the performance of certain works, which confirms that most of the concerns regarding the informatics achievement of the examined sub-system are organizational content, essential efforts requiring the elaboration and implementation of mathematical and scheduled resources. Therefore, unlike other sub-systems, it is necessary to perform mainly technological works to solve problems in a informatic way, just as the initial data are already organized on the physical memory space.

On the basis of the considerations founded so far and in view of the existing unsatisfactory level, it was found appropriate in the present material to develop and elucidate on a scientific basis the general thesis of the

specifics of the it-making of the sub-system under discussion. However, prior to this intention, in order to enhance the contributing role and functional value of the discussed activities, it is necessary to elucidate the primordial importance, necessity, evolution, existing situation and perspective issues of it accomplishment based on the field specifics [9, 7-43; 10, 86-147].

2 Compositional content

2.1 Intensity of information relations – decisive factor in informatics achievement

As previously established, from the point of view of the service of management functions, economic analysis forms a separate sub-system, which has information connections practically with any other sub-system of an information nature. These connections accentuate the dependence of the volume and quality of economic analysis on the results of the functioning of the other informational sub-systems. However, that particularity does not mean that the nominated dependency diminishes the functional value of economic analysis. On the contrary, the need to carry out the activities of such an analysis requires an increased degree of performance of the other informational sub-systems, the results of which must provide the initial data on time, of the quality necessary for the given sub-system. Therefore, the informatics accomplishment of the economic analysis informational sub-system (E.A.I₁.SS.) in the most direct way influences the level of informatics achievement of the economic informational system (E.I₁.S.) as a whole and of the management system.

The formed circumstances clearly underline not only the functional role, but also the contribution of E.A.I₁.SS. at the informatics achievement of all informational activities specific to the managed object. In this case, all economic analysis activities must be studied and carried out from unitary systemic positions, as they interconnect all informational processes of any category. Such connection determines the value of this sub-system within and in interconnection with

other sub-systems [1,83-85; 6, 273-276; 11,52-62].

Schematic interconnections and interactions. E.A.I.SS with other economic information subsystems are shown in Figure 1.

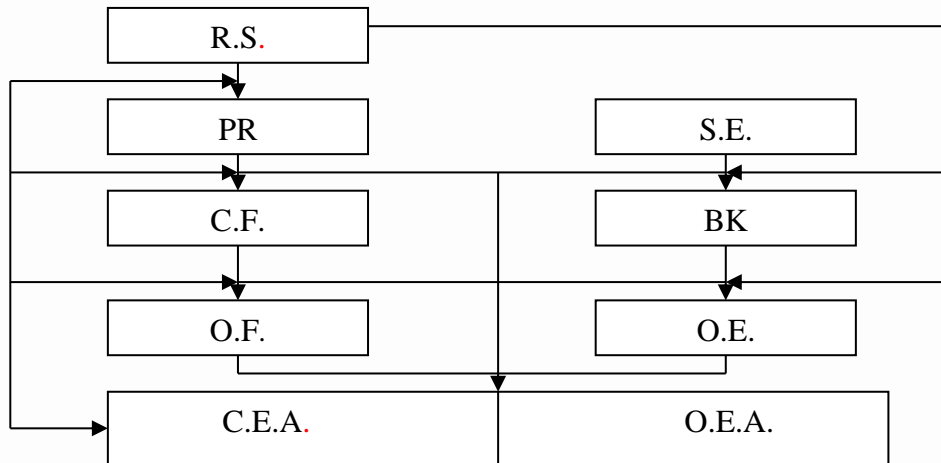


Fig. 1. Conceptual scheme of functional interconnections and procedural interactions between informational sub-subsystems of informative predestination and of economic analysis sub-system

The following signifiers are applied in the scheme: R.S. – sub-system of rate-setting and settlement; PR. – sub-system of prognosis; C.F. – the current foreseeing sub-system; O.F. – sub-system of operative foreseeing; E.S. – statistical evidence sub-system; BK – book-keeping sub-system; O.E. – operative evidence sub-system; C.E.A. – current economic analysis sub-system; O.E.A. – operative economic analysis sub-system.

From the presented scheme it is obvious that all economic informational sub-systems (E. I. SS.) provides resultative information (occasional, and primary) for economic analysis effectuation, therefore the decision-making information is formed, directly belonged to the unitary management process. Therefore, the impact of the analysis with management is the most direct, because within it takes place the separation of the decision-making sub-compartment from its informational sub-compartment. In addition, for the economic analysis informatics sub-system (E.A.Ic.SS.), any informational units of other sub-systems (technical, social, etc.) may also be offered. That's why the E.A.Ic.SS. completes E.I.S. activities. as a whole, while providing the necessary information for the management system.

From those elucidated it sums up that E.A.I.SS occupies an intermediate position between the informative and decision-making sub-system of the integrated economic management system (It.E.Mg.S.) [1,86-89; 3,189-198; 8,48-54].

2.2 Functional importance and the need for informatics achievement

The importance and necessity of informatics accomplishment of the economic analysis informational system (E.A.I..SS.) are caused and justified by the following basic factors [3,189-198; 4,35-50;]:

1) extreme functional value, because, unlike any other informational sub-system of It.E.Mg.S., decision values are formed within it, on the basis of which objects (activities) evolve. Therefore, of the quality of his information depends on the prosperity or bankrolling of the managed object. The above underlines the need to ensure the higher level of authenticity, opportunity, concreteness and fulness of the decisions made on the basis of that analysis. At the moment and in a long time, compliance with this level is only possible in the case of carrying out such activities in a informatics way is possible. The need for this achievement is also conditioned

on the direct contribution of this sub-system to the performance of the whole economic management system.

Achieving this aim is conditioned on increasing the promptness and authenticity of decision-making, which directly influences the efficiency of the results of economic material activities results;

2) by composition is enough complex, and by the number of procedures and operations – considerably bulky. Thus, the values of the characteristics of these two parameters indicate the urgent need to formalize informational activities and to create the prerequisites for the informatics achievement of this subsystem;

3) the extension of economic analysis activities in space and time requires the coordination of material processes in the same rays. This means that the in-question analysis refers to any economic object and activity, indifferently of their size and potential. In addition, the analysis can be performed for any time limits of the operation of any objects and activities. Such circumstances lead to the complication and increase of the volumes of works, which requires the implementation of informatics means and technological methods;

4) the pronounced dynamics of the functioning of objects and the performance of economic material activities, causing the increase of the promptness of analytical informational activities. Therefore, on the one hand, the evolution of economic material activities gradually leads to the complication of the content and the increase in the volume of economic activity, and on the other hand, such analysis needs to be carried out as quickly as possible. The exit from the created situation at the moment may occur only by the application of informatics means and methods;

5) all initial informational units are practically prepared by the other categories of sub-systems (economic, technical, social, scientific, etc.). For the given reason, in the case of accomplishment of all informational sub-systems, all the necessary initial data for solving the economic analysis issues are

practically prepared and can be applied in those purposes. This data is obtained as a result of solving the issues of any informational sub-systems. That is why their values are intermediate and can be automatically stored in the informatics system memory. In such a situation in the E.A.Ic.SS. environment it carried out more the calculation operations;

6) due to the complexity and excessive volume of mathematical formalization processes, currently programmed resources geared towards the informatics development of economic analysis activities are reduced. This explains the insufficient level of automatic performance of this analysis. In addition, the informational base is not organized in the manner necessary for the full informatics achievement of the present functional sub-system;

7) for most economic material units and activities, the lower level of automatic implementation of all information sub-systems is characteristic, which is why this analysis does not take place in the manner required by the integrated management system.

It summarizes the fact that the fullness and quality of the works of the economic analysis informational subsystem directly depend on the fullness and quality of the its performance of any other informational sub-system, belonged of the unitary informational system of the organizational unit [5,126-143]. In the market economy this way of achieving of the elucidated sub-system is of significant importance, as its results directly influence the evolution of material objects and processes.

2.3 Evolution, existing situation and prospect of informatics achievement

The radius of the spatial and temporal extension of the informatics achievement of E.A.I.SS. is directly related to the composition, complexity, content and volume of economic analysis activities. Therefore, its evolution needs to be tracked depending of the ray of the effecting of analysis itself [2,308-325; 4, 60-64; 5, 155-159; 9,122-137].

It should be noted that initially the activities of analysis of economic material processes were not well known. Something was taking place because the material activities are limited by the dimensions of the physical space of human existence and activity. At the given stage, practically where it was produced, the acquired resources were distributed and consumed, without going outside the material processes of other subjects. Therefore, as a rule, only the evidence of these resources was carried out, and the analysis was more limited to comparing the initial volume with the available volume of resources at the moment. Gradually, during the extension, the increase in the complexity and volume of economic material activities, certain methods of economic analysis were developed and formulated, while determining the respective composition of its indicators. Therefore, as the ray of elucidated activities expands, more and more compound and voluminous activities become also economic analysis activities. For this reason, the way of complex and systemic approach to these activities was also imposed. Consequently, from the positions of the integrated unitary system of economic management of the organizational unit, economic analysis activities shall be organized in the form of an informational sub-system. In the variant of informatics achievement, due to the increasingly complicated and exaggerated volume of works, such a sub-system can be considered as a separate informatics system. In this situation, it is necessary to set up and operate as efficiently as possible the economic informatics system as a whole, consisting of the informational sub-systems preceding the economic analysis.

Currently most complexes of economic analysis problems are insufficiently carried out both manually and automatically. And in one case, and in another, the main reason for the created situation is the considerable volume of informational works and the insufficient degree of automatization of the preceding the analysis informational sub-systems. Also, at the functional (content)

level, the theoretical concept of economic analysis of economic material activities within the unitary material-informational system of economic management is insufficiently developed.

All these circumstances have led to the situation that economic analysis activities are carried out fragmental and, as a rule, are reduced to determining the degree of performance of the laid down tasks and of the respecting of preliminary established rate-settings. The analysis itself is more intuitive, based on some functional worker's work experience in the concrete field, being carried out within short time limits and limited ray [2, 270-292; 10, 173-179;].

Compared to other informational sub-systems, logically the sub-system of economic analysis is highly composed. For this reason, mathematical formalization (algorithmization) of issues presents a certain complexity, and the elaborated algorithms do not have the necessary degree of authenticity. That's why they always need to be reviewed, modified and determined for each new time period and other new resources (equipment, raw material, technology, etc.). The instability of mathematical formalization is also caused by the pronounced dynamics of economic material activities, which refers not only to processes, but also to resources.

On the basis of these considerations, at present, oriented and based on the specifics of the market economy, both conceptually and practically a unified methodology of economic analysis is not developed and applied. This situation explains that currently the informatics achievement of economic analysis issues currently refers in particular to the study of the market and the possibilities of its saturating by means of ensuring a certain volume of manufacture. Therefore, in present the automatic performance of economic analysis is imposed by material, financial, human issues, which exert vital decisive influence on the efficient functioning of the economic organizational unit [4, 59-74; 7, 301-323].

Based on what has been elucidated so far, it can be found that the perspective full of

informatics achievement depends on the following essential factors:

- 1) granting due attention to the field of economic analysis;
- 2) organization of specialized in the activities of the sub-system sub-divisions;
- 3) elaboration of the unitary methodology of economic analysis, based on the specifics of the national economy, branches, sub-branches and economic material units;
- 4) ensuring the high-performance level of informatics achievement of all sub-systems, the products of which constitute the informational base of economic analysis;
- 5) authentic mathematical formalization (algorithmization) of the content of domain issues;
- 6) the intensive application of new informatics technologies in economic analysis activities.

Mainly, the full informatics achievement of the economic analysis informational sub-system is primarily (first of all) conditioned on (of) such activities as algorithmization and obtaining for the automatic operation of this sub-system of the necessary initial informational base

2.4 The approach of making concept of the economic analysis informational sub-system (E.A.I.SS.) within the integrated management system of the organizational unit (It.Mg.S. O.U.)

The concept of the informatics achievement of the economic analysis informational sub-system. is both general and specific. The first is based on the common properties of the unitary economic informational system. The specific concept is subject to the particularities of carrying out economic analysis activities, referred to the managed material objects and processes.

In general plan, the informatics accomplishment of the in-question activities is first reduced to considering their systemic character. Such characteristic, in turn, is motivated by the existence and functioning of objects, carrying out of the integrated in space and time material economic activities. Therefore, such analysis is required for any resource and process, regardless of their size

and potential. Because they are found in a certain interconnection and interaction, and the analysis of their functioning must be carried out in the same way, that is, from systemic positions. In such interpretation, the systemic approach to the concept of the it-making of the elucidated sub-system is based on the tracing out and achievement of informational and procedural connections, without which the issues of analysis cannot be solved. Therefore, any of the given category issue requires minimal the involvement of information from two economic management functions. In fact, the following variants of functional information combination are often applied for analysis purposes: a) evidence- + foreseeing; b) evidence + rate-setting; (c) statistical + foreseeing; (d) statistical + rate-setting; e) foreseeing + rate-setting [2, 135-139; 9, 60-121; 10, 86-147].

The full informatics achievement of the sub-system also stipulates the same achievement of the other economic informational sub-systems (E.I.SS.). This leads to the organization and processing of all economic, social and technical information automatically. Otherwise or partial informatics accomplishment, the results of solving the problems of economic analysis will be of a particular nature and not fully resolved, and their results will be probabilistic and not accurate. Therefore, the fullness and quality of the it-making of this domain are directly influenced by the same parameters of any informational sub-systems.

The complex nature of this analysis also contributes to the most stringent and accurate achievement of the informational connections between economic issues in the following two positions:

- 1) from the descriptive (of reflection, characterization) positions as broad and multilateral as possible of material objects and processes;
- 2) from the positions of the involvement of descriptors in the processes of processing and applying the values of informational units.

The informatics achievement of these two approaches in the first case envisages the determination of the variety and volume of

informative content needs of the economic unit. In the second case, as in the first on, the first is required to establish the needs, only for decision-making, of the same organizational unit, with the determination of the composition and succession of the involvement of their informational and processual units.

In this meaning, it is necessary that the conceptual approach to the informatics implementation of economic analysis activities is mainly oriented not only towards obtaining the values of the informational units, but towards their application.

It follows that the level of the sub-system is directly influenced by the same level of sub-systems, the informational products of which constitute the informational basis of economic analysis activities.

It should also be borne in mind that the specificity of this achievement is conditioned on the peculiarities of actual objects and activities, which depend on the branch properties, the volume of potential, the composition and structure of the management system, which predetermines the informational content of the basis for calculating the values of the analysis indicators. For this reason, both the content and the composition, the periods of solving the sub-system issues are different for different economic units.

2.5 The peculiarities and principles of the establishment of the economic analysis informatics sub-system (E.A.Ic.SS.)

The concept of the informatics accomplishment of the economic analysis sub-system is based on certain peculiarities and principles for carrying out certain works, which in turn decisively influence the modalities of its constitution [9, 97-121; 10, 17-85].

The following features of the constitution of the E.A.Ic.SS. shall be considered as basic:

1) effectuation of all elaboration, implementation and operation works of E.A.Ic.SS. in interconnection, i.e., systemically;

2) within the examined sub-system, the informative processes are completed and the decision-making processes are initiated;

3) the maximum use of all information of any category, as the economic analysis implies any characteristics of the resources and activities belonging to the unitary economic material process; 4) excessive complexity of the transition from informative to decision-making information. If the first in a particular layout contain passive (descriptive) elements, then the seconds are action information. Therefore, the functional value of the E.A.Ic.SS. is extreme, as it depends on the results of the material activities of economic units. Hence the strict requirements put forward to the quality of solving the issues of the sub-system;

5) the possibility of an integrated intermediate informational provision, as practically all initial information consists of the results of solving the informative issues of the other informational sub-systems;

6) the intersective informational nature of the sub-system, as solving any of its issues (whether elementary or complex) requires the application minimal of two categories of information. But in most cases, especially when determining the influence of factors on formed deviations, a number of different information is applied;

7) the need to carry out continuous economic analysis activities for any economic material object and activity within any time limits. For this reason, the weight of operative economic analysis is gradually becoming more and more considerable and, therefore, the qualitative requirements put forward in relation to economic analysis are becoming more stringent, which emphasizing the need to apply the informatics technique and technology in this field.

In both the establishment and implementation and operation of the E.A.Ic.SS. there is a need to respect and guide certain principles, which as a whole form that concept. With regard to the basic elucidate sub-system, the following principles shall be considered:

1) the trend towards full automatization, which facilitates and accelerates the transition

from the informational informative sub-compartment to the decision-making sub-compartment of the unitary economic management process. However, this trend direct depends on the level of automatization of the other informational sub-systems [2, 270 – 295; 10, 104 – 147];

2) regime of real time of solving the issues of the examined sub-system. This principle clearly depends on the level of achievement of the first principle and is conditioned on the automatic performance of all economic informational activities;

3) the fullness of the coverage of the informational environment of the integrated economic management system by the solved within the examined sub-system decision-making issues. Thus, principle again depends on the level of involvement of informatics technique in the informational activities of both the examined sub-system and the other informational sub-systems, which providing information for economic analysis purposes;

4) the principle of new problems, which boils down not only to the counter-intake of the values of indicators of various categories, but also to the application of modern methodologies and methodic, which, due to their complexity and essential volume, cannot be achieved in the manual environment;

5) the principle of intensive application and the extensive spread of rational informatics technology;

6) application of most of the characteristic principles for automatized organizational economic management systems.

The respecting and guidance of the listed criteria allows the in time and space coordination of the functioning of the economic analysis sub-system with the constituting its informational base other sub-systems.

3 Conclusions

As a result of the investigations on the subject of the work, the following basic conclusions are drawn: 1) Place of the economic analysis informational sub-system (E.A.I_i.SS.) within the integrated management system (It.Mg.S.) is concerned with two possible variants of the operation of the managed objects. In the case,

where the activity of one of them is initiated (variant I), the works of analysis shall be carried out after the completion of the informational activities of all sub-systems not only of economic content, but also of any other category (technical, social, natural, etc.). Therefore, at the level of economic unity, most of the initial information units of the sub-system, obtained by the other sub-systems, have resultant values. At the same time, it is not excluded that informational units with primary or intermediate values are used at the lower management levels.

If the process already working (variant II), the new cycle of activity of the management system starts on the basis of the results of the analysis, which causes changes not only in the material environment, but also in the informational environment (initial sub-systems), and is completed with the evidence sub-system. But, regardless of any variant, the analysis function is objectively imposed both within the initiation and the day-to-day functioning of the managed process. This situation will be repeated, until the end of the existence and evolution of It.Mg.S.

2) E.A.I_i.SS. occupies an intermediate position between the informative and decision-making sub-system of the integrated economic management system (It.E.Mg.S.)

3) Being the transition bridge from the role of reflection (passive role) to that of management (of action, active role), the sub-system is the imperious factor in ensuring the functioning of the management system.

4) The relatively satisfactory coverage with informational technologies of the other sub-systems, the functional place and role essential shall indicate at favorable possibilities and imperious conditions for the fullest possible informatics achievement of economic analysis issues.

5) The importance and necessity of the informatics accomplishment of the E.A.I_i.SS. are caused and justified by certain basic factors, including extreme functional value, compositional complexity, considerable volume of various procedures and operations, etc.

6) The spatial and temporal evolution of such an achievement is directly related to the evolution of the above-nominated factors, and its perspective depends on the level of subjective approaches and the conditions of objective reality in the economic informational field.

7) The concept of the it-making of the E.A.Ic.SS. is based on the common properties of the unitary economic informational system and is subject to the specifics of carrying out the activities within it.

8) The success of the full inclusion of the sub-system with informatics means and methods is conditioned on the level of the determination of the composition, formulation, guidance and achievement of the particularities and principles of the establishment of the economic analysis informatics sub-system (E.A.Ic.SS.).

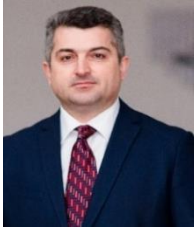
References

- [1] T. Leahu, A. Cotelnic, Perju Veaceslav "The information interconnections, as a contributing factor to the automatic achievement of informative issues within the framework of the integrated economic management system" In: *American Romanian Academy of Arts and Sciences. ARA Journal of Sciences*, 3/2020, p.81-89.
- [2] T. Leahu, "Bazele sistemelor informatice" *Note de curs*. U.E., GlobeEdit, 2019, p.189 - 198
- [3] M. Mureșan *Sisteme informatice de gestiune*. București, Editura ProUniversitaria, 2013, p.35- 50,59-74.
- [4] Nicolescu O. *Sistemul decizional al organizatiei*. București:Economica, 2012.632 p.
- [5] T. Leahu, *Organizarea, structurarea și transformarea informațiilor sistemului managerial economic. Monografie*. Chișinău, C.E.P. USM, 2009, pp. 47-64, 273-276.
- [6] I I. Radu, Minodora Ursăcescu ș.a. *Informatică și management*. București, Editura Universitară, 2005.392 p.
- [7] Tudor Leahu, Larisa Hâncu *Bazele sistemelor informatice economice. Note de curs*. Chișinău, CEP USM, 2005, p.307-323
- [8] F.S.Leahu *Economicescaia informația: organizația, structura i preobrazovanie*. (rus). *Monografie*. Chișinev, "Contabilservis", 1996. p. 25-44.
- [9] V.S. Rojnov *Informaționnoe obespecenie hoziaistvennoi deiatelnosti predpriiatia* (rus). Moscva, "Finansî i statistica", 1987. 144p.
- [10] V.B.Liberman *Avtomatizirovannaia sistema obrabotchi economicesci informații na predpriiatia* (rus). Moscva, "Economica", 1981. 184p.
- [11] F.S.Leahu *Informaționni sistemî i structura dannîh* (rus). Chișinev, C.P.I. im.S.Lazo, 1978. p. 52-62.



Tudor LEAHU, corresponding member of American-Romanian Academy (ARA), ass. prof., doctor of Department of Information Technologies, Faculty of Informatics, Engineering and Design at Free International University of Moldova. Author of more 300 publications, inclusively 7 monographs, dozens of course notes, practicum brochures and over 300 journal articles, thesis. Research areas: elaboration, implementation and working of the economic informatics systems (E. Ic. S.), economic informational systems and data

structures, informational and informatics technologies, the economics, protection and efficiency E.Ic.S. His work focuses on the management (organizing, structuring and working) of situational information in the environment of the conceptual integrated Ic.S. of unitary economic managerial systems.



Alexandr GRECU, lecturer, engineer, senior researcher at Free International University of Moldova, Faculty of Informatics, Engineering and Design, Department of Information Technologies. Competence areas: juridical aspects and information audit in ICT field. Research fields: Economic Informatics, Information management of personal data.



Victor MORARI, lecturer, engineer, senior researcher at Free International University of Moldova, Faculty of Informatics, Engineering and Design, Department of Information Technologies. Head of Division at Informational Technology Service of the Ministry of Interior. Competence areas: projects for ICT architecture and information systems development. Research fields: juridical and technical aspects of personal data protection, implementation of information security management.