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GENERALITIES RELATING TO THE IMPERATIVE, EVOLUTION AND CONCORDANCE OF MEANS AND METHODS OF PROTECTION OF ECONOMIC INFORMATION AND INFORMATICS RESOURCES

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Abstract

The compelling factors, characterized by the circumstances and environments of the current and prospective economic information and informatics systems, which objectively contributed to the urgent need for invention, elaboration and use of the various means and methods of protection of informational resources, are elucidated. The functional value of the domain concerned in the market economy environment and integrated informatics systems is accentuated. The content of the material is structured and rendered from the positions of the unitary economic management process, which carries out not only informational activities, but also materials in interconnection and direct interaction in real-time mode. Its subdivisions are also specified on this basis – determined the scope of the application of the above-mentioned means and methods under the existing conditions of the processing of informative content information values. In the given context are systematized and analyzed the subdivisions of the previously nominated process, its constituents. The general scheme of interconnection and interaction between the parameters of the protection and effectiveness of the functioning of economic integrated informatics systems is established and developed. Depending on the environments of application, the categories of protection of information units, physically made in the form of data, on manual and informatics memory environments are highlighted. At the same time, in terms of mutual influence with informational resources, some aspects of the protection of other informatics resources are elucidated. Tangentially, the terminology is examined and the consistency of the means and methods of organizing and carrying out the processes of data protection is carried out. The problems of this section of economic informatics and possible ways of solving them are formulated.

Keywords*: categories, consistency, means, methods, issues, terminology factors, data protection, integrated informatics systems*

1. Introduction

In advance of any research or development activities in the previously well-defined direction, it is objective impose the formulation, knowledge and exact application of certain specific terms for the concrete scope of their use. Neglect of this thesis makes it impossible to initiate, develop, implement and operate the managed object (process).

In this respect, informatics resources protection processes have also called for and have been increasingly requested, have submitted increasingly stringent requirements for the completion of procedures, processing and retention of the composition, structure and content (values) of previously nominated resources units. It should be noted that in order to satisfy and respect these primary requirements, the need arises in the formation of certain terminology consistent with the composition, configuration and logic of the evolution of the area of application. For the reason given, both for the theory and for the practice of the elaboration and functioning of these systems, of particular importance it provides clarification of the essence and content of some basic terms in this field.

In the context of what has been set out so far, in relation to the protection of economic informational and informatics systems, a relatively high number of terms, sometimes with contradictory content, are not directed towards the real environment that caused their formulation and use. Therefore, starting from the complexity of the composition of the resources, notes of all the sphere of informatics concerns, sector, sub-sector, compartment, resource and constituent component of them are required to be developed and applied. In accordance with such a desire, general, intermediate and particular terms may be highlighted.

The situation created at the moment and the premises of the possible evolution of economic management increasingly imposing confirm the need for its gradual transformation, as an organizational unit, into a material-informational core of automatic analogous action. In such circumstances, the direct and immediate decisive influence of human material and spiritual activities on the state of informational processes is not excluded. As a result of the formation of this conjuncture, the protection of informational units, operations and handling procedures with them will have extreme management value, as their prompt 'alteration' will spill over to the activities in question. For this reason, the systemic approach and integrated treatment will be imminent for any economic managerial ground, regardless of the dimensions of its existential and evolutionary spatial and temporal rays. It should be emphasized that the actuality of the informatics resources protection problem is caused primary by the massive implementation and use of them in any field of human activity and, in particular, economic informational works, own for any category of occupations.

Just as the efficient functioning of economic informatics systems (E.Ic.S.) is ensured by the proper interconnection and interaction of its constituents, such concern becomes iminatingly impossible. Its complication and imperiousness become even more evident when applying the means and methods that require the actions to be carried out automatically. In this situation, it is not out of the question that a single error will lead to the alteration and collapse of the system.

For the above reasons and at the beginning of the present article, convincing awareness of the compelling role of the protection of informatics components, deep knowledge of evolution, the distinction between their reliability and security, the categories and the consistency of the means and methods of these processes, which will contribute to the performance and notorious of the works related to obtaining informational products in the informatics environment.

2. The degree of investigation of the problem at present and the purpose of the research

The field under investigation is characterized by numerous publications mainly in the general aspect and less in relation to each category of external and internal resources and technological units of operation of the E.Ic.S. Totally absent are the investigations concerning integrated systems, which directly and temporally perform the analogous material processes depending on the composition, structure and values of the informational entities.

Also, the problems of information security are often accosted, but mostly with reference to the physical environment of the informatic technical means, especially to the computer's memory space. At the same time, it is known that the range of physical environments of both the computer and many other classes and categories of such means are quite varied, but conceptually and practically their protection is in its infancy. They are not fully covered by informatic methods and means to protect not only the information resources, but also the other resources of the E.Ic.S.

The issue of ensuring the protection and security of all resources of this variety is not addressed from the positions of their integration, without the analysis of interconnections and interactions with the aim of creating a unitary system of their protection.

Obviously, the created situation could not fail to affect the correctness of the formulation and use of terminology, the peculiarities of its application, the examination of the possibilities of constituting methods and means of protection depending on the specific characteristics of the exploitative parameters and the reliably efficient domain operation.

The same condition can be characterized the level of investigations into the composition, disclosure of the particularities of the factors and problems of the concerned field. In terms of integration, insufficient is revealed first the evolution, analysis of the environments, means and methods of protecting all informatics resources in interconnection and interaction, and then – each one of such listed characteristics.

Based on the elucidated considerations, in the present material, at the conceptual level, attempts are made to specify the terminology, to sort the most productive methods and means of protection, to reveal the evolution, determine and analyze the factors and issues of the researched area.

3. Methods and materials applied

With the excessive increase in the volume and complexity of the compositional field of activities, in particular, of social character, such as information and other economic informatics resources, the issue of their protection is becoming more and more acute. Given the extremely varied variety of constituents composition of this category, the procedures and operations exercised on them, the research field was based on a fairly wide range of conceptual sources and practical experiences.

Thus, the conceptualization of the elucidated sector was carried out taking into account the fundamental thesis of theory, analysis and synthesis of methods and means of protecting information of circulating informative content in the economic management system and its

informatics sub-system. Also, along the way, were considered, the fundamental principles of managerial theory, systems theory and systemic analysis, multitudes theory, informatics theory and economic cybernetics, a.s.o.

The basis of the investigations are scientific publications on the specifics of the protection of informatics processes in general and economic, in particular, informatics systems, economic informational management and the fields adjacent to these branches of activity. In the same situation, materials related to the elaboration and implementation of the design decisions of the formation and day-to-day operation of the informatics systems of the social-economic units, their protection, the results of the university scientific activities, the normative and legislative acts of the Republic of Moldova in the management, informational and informatic fields, the results of the author's own investigations were taken into account.

4. The obtained results and discussions

4.1. Some approaches to the essence and content of domain basic terms

In bibliographic sources [1-4, a.s.o.] and the most commonly used practical data protection activities are the terms "reliability", "security", "protection", "privacy", "integrity", "risk (danger)". Although each of them has a certain degree of synonymy, not all could be used equally for one element or another of the informational (informatics) system. Thus, for example, "security" is interpreted as minimizing the vulnerability of system elements, and "danger" - as a potential breach of security. As data processing systems increase the performance, the value of unintended and intentional hazards becomes more and more evident.

The broadest is considered the notion of "protection", which refers to any resource of the informatics system. Therefore, with regard to informational resources, it includes in itself ensuring the confidentiality of data, protecting information from changes and falsifications, winding up (deleting) it and excluding the "gripping" of the system's resources with their monopolistic mastery "Informational protection" refers to the whole system of organization, transformation and use of the data and to each component (resource, activity) of it in particular. Therefore, in each individual case it is determined differently, depending on the objects and actions, for which it must be insured.

Also, "informational protection" includes a totality of actions, methods and means that ensure the resolution of such main problems as the verification of the integrity of information; exclusion of unauthorized access to computer resources, programs and informational data, exclusion of unauthorized use of programs (program copy protection).

Reliability characterizes the degree of safety of a system or its component according to the purpose designed and achieved; capacity to operate for as long as possible. Therefore, the notion refers more to the physical (material) part of the system, at least that at the general level it can also be used in the sense of living, thoroughness, safety and even security of any element of the system.

At the same time, "confidentiality" has a particular task to the meaning of the content of informatic resources and consists in ensuring the non-detection of the essence, composition, number, structures and values of informational units.

Also, "integrity" as a term refers mainly to the informational part of the system. In this plan it boils down to ensuring the fullness and accuracy of the values of the data by excluding their occasional or intentional modification, their cancellation by deletion.

As stated above, protection relates to any resource of informatics systems and therefore the term is considered to be of the most general level, which is why it is justified to include the parameters contributing to its achieving. In such a way, depending on the category of resources and the purpose of protecting them, the term elucidated encompasses the notions of reliability and security. So, by ensuring a certain degree of reliability and security, a certain effectiveness of the operation of the system is achieved. On this basis, the interconnection and consistency between the notions of elucidated parameters of schematically nominated systems can be presented in fig.1.

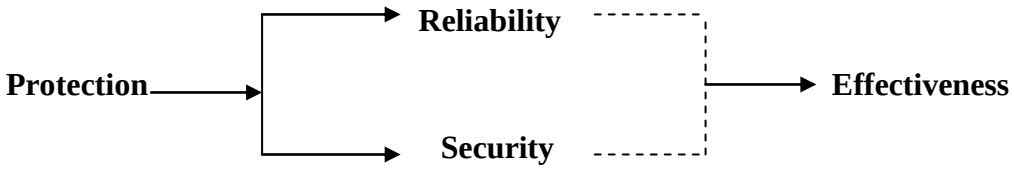

Figure 1. Scheme of interconnection and consistency of parameters terms of the protection and effectiveness of the economic information systems (E.Ic.S.) functioning

It should be noted that reliability refers, in particular, to the functioning of E.Ic.S. resources, whereas security has a predominant role in their existence ("preservation"). Therefore, the first ensures the functionality of technical and technological resources, and the second - access and confidentiality of other resources. However, whatever is not done in this area everything is oriented towards a single purpose - ensuring the quality of informational resources, which fully characterizes the efficiency of E.Ic.S. It is known as in the U.S. (according to the statement and data of the company C.N.N.) the amount of losses from security breaches and non-insurance of E.IC.S. reliability, reached figures of tens of billions of dollars [1, pp. 311-312; 3, pp. 33-35].

Importantly, for the market economy it is characteristic to apply as frequently as possible the selective principle of the application of informational resources in management activities. It boils down to that concept that the variety of selection is directly dependent on the complexity, composition and fullness of the content of these resources. Therefore, the more varied and voluminous the information kept on the physical memory environment of the informatic technics, the more operative and random is their selection at all times.

In this context, there is currently a lot of economic information, which without awareness of the need to train and display not only the resulting ones, but also the initial ones, also complicates and sharpens the issues of protection and efficiency of E.Ic.S.

As the practice of the functioning of E.Ic.S. evolves, the obvious specialization of informatics services in the form of certain organizational subdivisions within economic units is increasingly required, rarely being carried out in the form of data protection services predominantly in the banking, state, internal affairs sectors.

As is well known, economic informational systems are characterized by considerable volumes, compound composition and extensive spatial distribution of its elements. For this reason, there is a need to ensure a certain consistency between different levels and their compartments in such a way that the objects and economic processes served by them have continuous prosperous evolution.

In the given context the informational connection contributes to the integration of economic activities, in the form of a unitary system for carrying them out, which in reality and it is necessary to be produced.

At the same time, the integrated organization of the data submits pressing issues regarding their security because its realization is conditional on the informational connections between the problems solved. Under such conditions, the "deterioration" of a data unit can affect the quality of the informational system as a whole. Therefore, the integration of data into the processes of organization and objective transformation sharpens the need to ensure strict protection.

4.2. Specificity of the functioning of the existing applied scope – imperious of protection

In the above-mentioned context, preliminary to the establishment of the protection system, there is a pressing need in the analysis of the level of integration of the current economic management system and implicitly of its informational sub-system. Both are characterized by spatial isolation and discrete evolution of material and informational processes, which virtual and analog interpretation form a whole. Hence - the multiple discrepancies between the activities of these two categories of processes, the crumbling of the management system by management levels (primary, intermediate, superior), operating periods (operative, current, prognostic) and the informational system by sub-systems, complexes of problems and particular problems.

Such a situation has led to the most expressive effects, in particular, at the intermediate and higher levels of management, of the subject's influenceable role on material and spiritual events both of the human society as a whole and of each subdivision, its individual. Conditions have been created to favor the negative trend of the management system on the object (process) managed, as well as to the predominance of administrative methods and means applied in virtually any space and moment of management. From unitary positions, all these moments, with prevalence, are caused by the inadequacy of the performance level of the management sub-system compared to the sub-system managed by it. The formation of that rupture occurred with the establishment of the social character of human material activities, as a consequence of the severe dispensing of qualitative information.

The analysis of the course of these two constituents of the unitary economic management process reveals the objective approach to the liquidation of territorial isolation and their discreet functioning. At present and from the beginning of the socialization of the activities of the subject so forward is observed and is achieved by the invention, elaboration and application of various technical means, programmed, technological methods, etc., considered as informatics resources.

Drawing a parallel between the progress of the development of the elucidated resources, it becomes noticeable that the above have advanced essentially, whereas, in terms of the total inclusion of the information phenomenon as an integral unit, their application in the economic informative and decision-making fields is insufficient. For the purposes of this regulation, satisfactory coverage by the means and methods of computer is shown only by a transformative stage of the information – the stage of processing (informational, structural, calculational), the other two stages – initial and use remaining carried out mainly manually by the subject. As a result, a substantial discrepancy was formed between the performance levels of the methods and means of informational technology and the scope of their application. This situation can be classified as the failure to prepare informational resources for the involvement of the nominated resources in their processing.

The created circumstances are caused by spatial expansion and unimaginable speeds of realization of human material concerns. This is what the evolutionary formulation of the concept of globalization of the activities in question is drawn about, an objective being driven by the imperative of material – informational integration. Otherwise, by saying, material globalization has provoked and cannot be achieved and functioned without information globalization.

It should be noted that at present and permanently, in the processing of data with good reason and justification, the informatics resources listed above are considered decisive. However, no less valuable for this method is also the adequacy of the structure and organization of informational resources, their procedural and functional interconnections. The consecutive implementation of these two categories of interconnections ensures the continuity of all informational processes. Where continuity is supported by technical means and methods, it shall become automatic. Therefore, not only informatics factors, but also the very field – informational resources, through its rational structural interconnections, of efficient organization and processing, contribute directly to their machine processing. That is why, decisive importance in supporting the automatic functioning of the integrated economic management system provide for the identification, compliance, commissioning and guarantee the technical functioning of interconnections of any variety within the system.

From what has been elucidated so far, from a scientific and designer point of view, it summarizes the justification for the elaboration of the unitary concept of creating and ensuring reliable and efficient officials of a informatics system, which would integrate into an entire indivisible the resources and processes (materials + information) belonging to it. This system is required to be not only compositionally and structurally unitary, but also totally interconnected and procedurally integrated.

On the basis of those considerations, the conception of the integrated informatics system lies in the inclusion with informatics processes not only of informational activities, but also materials in interconnection and direct interaction. The unity of this system refers both to the organization and structure and functioning of all its constituent elements from unitary positions.

Such an approach requires the elaboration, implementation and assurance of its daily evolution by establishing and carrying out all constituents, interconnections and interactions between them, regardless of territorial and temporal rays on the basis of the principle of

motivation, according to which matter causes information, the latter being of informational and decision-making predestination.

In addition to mentioned above, with the exact and full determination of the mentioned characteristics, their exact compliance and achievement by means of the informatics factor, conditions are created for the establishment of an analogous, i.e. automatic and not automated, economic management system, which is unique for such systems at present. In this situation the system will operate according to the scheme in fig. 2 [1, pp. 251-253].

The scheme of the conception of the succession of interconnection and interaction of compartments and sub-compartments of the economic integrated unitary process in fig. 2 is based on the principle of motivation and the variant of the initiation of its evolution.

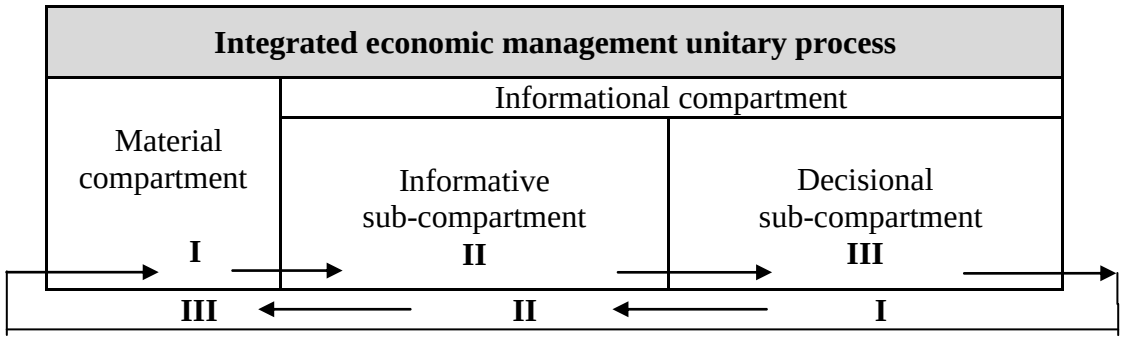

Figure 2. Conceptual scheme of operation of the integrated unitary economic management process

If the process already works, such orders are reversed, i.e. the decisions formulated affect the material processes, the last – the informative processes, and the latter – the exact repeated formulation, the authentic taking and the efficient realization of the material processes, according to the new decision values, a.s.o. until the end of the operation of this process. As can be seen, in both situations, within this material-unitary information cycle, the yield of compartment I and of the products of sub-compartment III (variant I → II → III) decisively depend on the level of authenticity of the products of sub-compartment II, which establishes the imperative of its most reliable protection.

Consideration should also be given to that circumstance, according to which the formation (appearance) of a new activity or complex of activities is motivated both by the results of certain imposed experiments (practices) and by the consequences of the evolution of processes. In this respect, today the evolution of economic information systems (Ic.S.) has led to the emergence and accumulation of the many and increasingly varied and voluminous issues that require daily resolution, significant efforts and resources. Among them the first order of valorization and conceptual is considered those that ensure the necessary degree of reliability, security and effectiveness of these systems. Most importantly, the practice of their functioning gradually required the field of cyber and economic informatics to form certain branches of theoretical knowledge and practical skills regarding the carrying out of the nominated activities (reliability, security, effectiveness) [4, pp. 205-208].

Just as material and informational economic processes are carried out spatially and temporally, there is a need to coordinate them within these rays. For this reason, any actions

and activities relating to them require a systemic approach of a scientific nature. In addition to those mentioned, it is necessary to note that E.Ic.S. is a rather complex unit, being composed of various resources, of which the basic ones are technical, informational, mathematical, programmed, technological, economic, socio-legal, a.s.o. Such specific essential objective has led to the consideration of the interconnections and interactions between these components in such a way that the system in question functions as efficiently as possible, obtaining the most qualitative informational products with the lowest consumption.

The importance of data protection is also motivated by the peculiarities of the market economy environment, which amplifies the functional value of ensuring these qualitative parameters of E.Ic.S. It is known the situation that in this practical environment is unlimited informational request of any object or activity, which constantly increases the volume and complicates the composition of informational resources. As a result, special attention is sought to protect the latter, which in turn is achieved through the reliability and security of all other resources (technical, programmed, technological, economic, socio-legal), the latter contributing to the overall effectiveness of the functioning of as a whole E.Ic.S.

4.3. Evolution, factors and issues to ensure the protection of economic informational and informatics resources

At the beginning, when the production, distribution and consumption of material and spiritual goods were of a particular nature and practically were not carried out in certain long periods of time and on a large spatial scale, the respective information on these activities, as a rule, was "acquired", memorized, processed and used by an individual or a small group of individuals (individual household) orally and within operational time limits (during economic activities, in a day or a few days), without involving in these processes certain special auxiliary supports and means.

On the measure of spreading of human economic manifestation material rays becomes more pronounced, the social character of the information in question and the informational processes require their conscious organization and execution. Therefore, if at the initial phase of human economic material activities, the spatial information flows were formed and carried out there, where the material ones, then gradually they became more essential and distanced themselves from each other and increased both the temporal deadlines and the scale of action.

In such circumstances the efficient functioning of the economic informational system is based not only on the spatial and temporal concordance of the information processes, but also on ensuring the protection of the values of functional informational units. The latter finds its explanation in the fact that with the integration of economic material activities into the nominated parameters, the integration of the accompanying information flows occurs automatically. As a consequence of the phenomenon produced it is sufficient that a single value of the information unit is "altered", or lost, and the informational system as a whole may not correspond to the demands of the concrete management system, just as the informational unit in question has a lot of connections with a lot of other such units and its "loss" ("alteration"), of course, negatively influences the entire information system. That is why the conception of organizing information resources in the form of separate files does not

clearly emphasize the value of data protection, as its non-assurance refers to each file and does not affect the entire informational system as a whole or a good part of it.

On the basis of this reason, the increase in the importance of data protection activities is also conditioned and by the following basic factors:

1) the evolution of the concept of data organization with the transition from separate files to the integrated unitary information base, which serves the whole economic object and each subdivision, participant (activity) and resource of it;
2) coordination and regulation of economic informational processes in space and time;
3) continuous increase in the number and volumes of functional information units;
4) increasing the structural complexity of these units;
5) the complexity of the compositional variety of the establishments concerned;
6) complicating the processes of organization, transformation and use of the values of the informational units within the management system of the economic unit.

In turn, these contributing factors to data protection have resulted in the need to:

1) highlighting, ordering and functional integration of structural information units, conditioned by the informational interconnection of the problems solved and the most economical use of the memory space of the computer system;
2) revealing, systematizing and structural integration of informational units with the aim of unifying their structure;
3) profiling, classification and integration of informational procedures, processing and use of structural data units in order to exclude their unjustified duplication and iterating.

Currently, the users of economic informatics systems are largely aware of the timeliness and urgent need to ensure the protection of information to be accessed and used in an unauthorized manner. However, although there are considerable number of publications, some experience in this area and a major interest in the given topic, the following main problems remain unresolved:

1) elaboration of a unitary approach to determining the purposes of ensuring the informational protection of the economic informatics (informational) system;
2) non-univocal interpretation of terminology;
3) elaboration of the unitary approach to the classification of factors of influence on informational security with the highlighting and systematization of intentional and potential risks (dangers);
4) the composition and rigorous observance of the unitary approach to the concept of protection of the information system as a whole and its components in particular;
5) elaboration of the unitary approach to the evaluation (estimate) of informational system resources protection;
6) drawing up the scientific unitary methodology and the various methodologies for its realization in determining the size of losses due to programmatic abuses;
7) elaboration of a unitary system of criteria (indicators) to determine the dimensions of the risk and efficiency of the informational security system [1, pp. 207-210].

4.4. Analysis of environments, means and methods of the protection of informatics resources

Data protection shall be carried out differently depending on the environment of their training and transformation. It highlights two environments of this nature – the informational system and the informatics system. The first includes all information that is organized, processed and used according to the requirements and within the concrete management system as a whole, both on the basis of manual and automatic methods. It should be recalled that the informatics system is nothing but the informational system made through technical means. It should also be borne in mind that the information system has not yet been able to be fully realized automatically in the economy to date.

Depending on these two environments, various means and methods of data protection characteristic of each of them have been invented, developed and applied, which have evolved along the way. Their varieties are predetermined by the types of media on which information is recorded differently. In this case, two groups of means and methods of data security are observed, one referring to documents and another - to informatics (technical) media. The first ones are considered manual, and the second ones - mostly automatic. In turn, the means and methods of manuals are of a physical nature, as they depend on the properties and physical "possibilities" of this category of media (documents) to protect information. They are developed and implemented for information systems based on the organization and transformation of information manually in whole or in part.

The means and methods of data protection characteristic for technical (informatics) media are both physical and programmatic. Within both groups of such means and methods (manual and computer), various organizational processes can also be carried out to secure the data. Physical methods are conditioned not only by the physical peculiarities of the media, but also by the devices of the technical means, informational and informatics technologies. In this respect, it can be assumed that with the performance of the construction of the building elements and the physical "hardness" of the technical means, the weight and value of the programmatic means of securing the data, possibly, will decrease.

In general, the ratio between physical and organizational means and methods depends on the quality and performance of the former and the social value of the information. The more imperfect the first ones, the more varied the composition of the organizational methods, at the same time as their continuous performance.

Apart from those mentioned, it is necessary to warn that, being invented and used by the subject, economic information is considered artificially produced and, on this occasion, the subjective aspect of the means and methods of training and protecting it is decisive. For the reason given the protection of this information depends not only on the performance of methods and means, but also on its value and social character. Therefore, the more the functional and social value of economic information is on the rise, what is natural and continuous for it, the more complicated and varied are the attempts to "alter" it and "liquidate" it as a product of supreme social importance. Contrary to these attempts, the means and methods of data protection are developed.

As previously established, the methods and means of ensuring the protection of data in the informational system are of a manual nature and limited by the properties of a single type of media - the document. For this reason, for the most part, they are physical and are carried out in an organizational manner. Some of them relate to the protection of the informational system as a whole (localities, auxiliary means, special furniture and other equipment for storing, organizing and handling documents), and others - to the protection of the functional content of this system (various cartridges, shops, cabinets and document storage shelves). As a rule, completed documents are organized in packages according to their training (perfection) deadlines (one day, five days, decade, month, quarter, semester, year, etc.) and on objects and activities (for example, documents on material value entries, their outputs, or on the fulfilment of certain volumes of works, a.s.o.). The protection of the informational content of the prepared documentation shall be ensured by the signatures of the persons responsible for the fullness and authenticity of the values of the recorded data.

Access to information is protected through various regulatory documents (regulations, regulatory, legal, administrative documents, service instructions, a.s.o.) of informational activities, functional obligations of users, a.s.o. In this way, apart from the physical and organizational means and methods, the protection of data is also ensured by the legal ones.

With the elaboration, implementation and functioning of economic informatics systems, the composition of their specific means and methods of protection has also changed. For example, the technical means of calculation must be distributed and exploited in such areas of buildings, which would ensure that they are protected from various destructive intentions. The places where these means are found must also be arranged and equipped according to the scientific requirements to ensure the conditions of physical maintenance of the nominated technique in the state of efficient operation and to exclude the possibilities of destroying or stealing them (iron doors, complicated padlocks a.s.o.).

It is also necessary to take a number of organizational measures to exclude access of unauthorized users to files and programs or the causes of their destruction. For this purpose, the release of media (tapes, floppy disks, C.D.) with files may be organized only on the basis of special approvals of authorized persons. Computer rooms and file storage sites must be protected against fire, dust, excess temperature and humidity, as well as other causes that may affect the retained data.

In the environment of economic informatics systems at large, the labelling of files (internal, external) is applied, which is considered as a means of protecting data from misuse.

File protection can also be done through the software, by entering certain parameters (speeches), which provide the possibility only of reading or reading and recording. Certain procedures may be used to restore files or perform destruction or retention operations on them. Copies of data files and resources programmed on media stored in locations other than computers are of significant importance.

In case of processing of data in batches, the protection procedure under the conventional name "grandfather - father - son" and its modifications are recommended. A similar procedure should also be performed if the files are updated online. In the context of the use of database management systems, additional measures may be taken by their administrator by developing and applying data dictionaries, specific forms of confidential control. If the data is strictly

confidential, it is recommended to destroy (even by burning) the initial lists or apply cryptographic protection by using secret data transformation codes. Encryption is recommended for data transmitted via telecommunications lines [2, pp. 126-135; 3, pp. 207-210].

The protection of data shall also be ensured by verifying their fullness, clarity and authenticity in each technological operation of their organization, perfection, preservation and processing. Their control shall be carried out by certain means, methods and procedures.

At the level of the economic informational system, on the basis of the following criteria (principles) of classification, all these methods and means can be systematized in the following groups [1, pp. 213-215; 2, pp. 234-245]:

1) complexity of framing (inclusion) – local and complex means and methods;
2) functional predestination – means and methods of anticipation (warning), risk detection and neutralization, restitution (recovery) of the system interpreted as an organizational unit of activity;
3) the nature of their categories – legal, organizational-administrative and technical-programmatic means and methods;
4) spatial area of action - means and methods for uncontrolled (external) areas, controlled territorial areas, for the locations of the operation of the informatics system, its resources;
5) operational stages of functioning of the nominated system - means and methods for input controls, during operation (regulation and constraint of redundancy, revision, refund), at exits from the system;
6) objectives of protection - means and methods of protection from unauthorized access, assurance of legal value, informational content, protection from the flow of information through system channels, protection from programmatic abuses, unauthorized copying, dissemination of confidential programs and information;
7) the character of the opposition - means and methods of active and passive protection.

From the given classification it is obvious that the composition of the methods and means of data security is quite varied and depends on the purposes of their application, the areas of realization, the modalities of execution a.s.o. The content and essence of some of them can be easily judged on the basis of their names. Others, however, require explanation, the latter being motivated by their value.

Off these positions, methods and means of anticipation are predestined to create such conditions, in which the possibility of the occurrence and realization of destabilizing factors (risks) is null or minimal. The methods and means of detection are oriented towards highlighting the hazards or possibilities of their occurrence and collecting additional information in this respect.

Technical-programmatic methods and means of ensuring data security can be active and passive. The premiums (active ones) are intended to delimit access to all informatics system resources (technical, programmatic, informational, etc.); transforming authentic data into unnecessary (false) information for the offender (cryptographic coverage); normal functioning of the system. Among the basic liabilities are considered the methods and means of

monitoring the functioning of the informatics system, processing and analysis of the data collected during monitoring, overhauling and auditing the number and optimal use of the system resources, as well as establishing (checking) the integrity and accessibility of these resources.

The composition of the methods and means of securing the data is subject to the varieties of hazards that may occur in the system. The possibility of achieving hazards depends on the narrow places (vulnerable points) of the system.

Any action contributing to the malfunction of the system shall be considered as a danger. Two types of data breach hazards are highlighted [1, pp. 215-216; 3, pp. 355-366; 4, pp. 53-57]:

1) unintentional or occasional;
2) intentional actions.

The first type of hazards is external and internal. The external ones refer to natural calamities, techno-genic factors, political, economic, social, the expansion of informational and communication technologies, a.s.o. Internal ones include the dangers caused by stopping the functioning of technical means, errors in scheduled resources, staff work, etc.

The most widespread intentional actions to violate the security of informatics system resources are considered as follows:

1) unauthorized access to information;
2) elaboration of specialized programmed resources for the purpose of unauthorized access;
3) elaboration and dissemination of informatics viruses;
4) negligence in the development, support and exploitation of scheduled resources;
5) theft of information;
6) unwarranted manipulation of data;
7) breach (non-compliance) of data privacy;
8) denial of the security of system resources and so on.

Knowledge of the theoretical bases, the provision of certain experience in the development, implementation and functioning of data protection systems in the economy will contribute decisively to the increase of the quality of informational resources, which in turn will lead to the performance of the management system, and last - to the improvement of the results of the activities of the economic material units.

Currently of significant importance it has the security of the informational resources of the informatics networks – most suitable for the automatic realization of economic informative processes.

This is extremely valuable for every computer connected to the Internet, or on an intranet, Extranet, and even a local network. Moreover, even for a P.C. stand-alone information security can be a serious problem when it contains personal, secret, certain degree of confidentiality information.

This security protects information from a wide range of hazards related to continuous business provision, minimizing damage and maximizing the recovery of investments and business opportunities. Regardless, the computer is in the office or on the desktop at home, ensuring the security of the information may have the same acuity. Obviously, in the case of

the network, ensuring security is a much more pressing and, at the same time, much more difficult problem. Many of the recent attacks, which have put a few very popular Web sites, some even government, at risk, have managed to cause panic situations to authorities in several countries, even heavily developed. Some voices have come to the fact that such dangers have become much more acute than previously thought by its sometimes unimaginable consequences.

There was enough evidence to support the position of those who believed that the hacker attacks were possible because only poorly protected computers were able to gain access. In other words, burglars are successful there, where rigorous technogenic security is not ensured.

The danger of computer sabotage based on viruses, which can do extraordinary destruction, is today well known and undeniable, not to mention viruses, which can take complete control of a computer in a network, such as the dangerous Trojan horse "Back Orifice".

Despite some rather well-developed legislative systems, the theft of information through the computer has greatly expanded, especially in some countries, which have advanced technologies. It is an extremely delicate area, and huge efforts are being made for data protection and security.

The above could only be a small part of the many reasons why it is necessary to pay particular attention to the security of information in computers.

One could say that most users of the largest and most important institutions in the world are under the cover of company or personal firewalls and that, in their case, security is completely assured. In reality, though, it's not quite like that. And evidence of that, of course, exists. Almost daily information appears on the Internet regarding the breaking of important websites, thefts of information from various networks, some of the best developed, and if it is still taken into account that many of the injured refuse to make public their accidents of this nature, even for the simple reason of not risking the loss of credibility or performance, then, of course, it can be confirmed that the statistics do not provide the real dimension of the phenomenon, and this is far more worrying.

In the context of business information and processes, on which systems and informatics networks are based, are particularly important topics. The three basic characteristics of information (privacy, integrity and availability) are essential for maintaining the competitiveness, profitability, legality and commercial image of an organization.

Increasingly, organizations, systems and their informatics networks are facing the threat of information security caused by a wide spectrum of sources, including fraud, espionage, sabotage, vandalism, fires and floods. A common source of danger is presented by attacks of electronic viruses, which can cause considerable damages and destructions. These means are becoming more aggressive and sophisticated.

Some businessmen and professionals have concluded that a sufficiently competent hacker can penetrate almost any computing system, including those that have been protected by password-based methods and data encryption. Others, more skeptical, argue that even when a system is well protected against outside attacks, it always remains the alternative of insider trading. Many secret data, such as customer lists, employee salaries, investments and budgets,

confidential reports, etc., can simply be copied to a floppy disk or USBFlash, and it can be removed from work, often even without a notice.

Mainframe computers solve the problem of theft through this source by keeping the computer and large data storage media locked. In the case of mainframes, the only way to use the data is by remote terminals, which are equipped with a screen, a keyboard, but not with disk drives. Because of this additional security provided by mainframe systems, some experts argue that local personal computer networks should be configured the same way, forgetting that excessive centralization of mainframes was one of the main reasons why personal computers developed.

Any regular connection to the Internet is not always without risks. The actual connection, absolutely innocent at first sight, could be accompanied by fraudulent sharing by a parasite or spy program, which has a very well-defined role: to steal some of the information manipulated, some of it, of course, of a strictly confidential nature for the owner. In this sense, there is certainly a great deal of distrust in the pessimistic assessments of some, and often, with or without permission, are exaggerated.

The transition to the informational society implies the need for credible information, and technological progress has exponential implications for their evolution. From this point of view, the need to secure information stored and processed through computers stems simply from the need for connection and communication, and globalization and the Internet have completely changed the face of the world to the confluence of millennia.

Personal computers have vulnerabilities because there is generally no hardware protection of internal and external memory: an executable program can have access anywhere in internal memory or on the hard drive. In any informatics system, protection involves providing programs and data against the following actions [1, pp. 220-221; 5, pp. 132-145]:

1) accidental losses caused by power failures, failure of hard drives;
2) unauthorized access to data and programs through password and encryption actions;
3) computer fraud (withdrawal or alteration of data, theft of services);
4) virusing of the software.

For effective protection it is necessary to know and secure the following elements:

1) identifying access through rules and relationships between users and resources;
2) the record (evidence) of access for tracking the use of system resources and for the possibility of restoring data in the event of destruction;
3) data integrity and confidentiality;
4) functionality of the programs.

The means by which protection can be ensured are:

1) organizational measures against destruction due to natural disasters, measures relating to the professional selection of personnel, the organization of an access control system, the organization of the preservation and use of information media;
2) legal measures, which include normative documents controlling and regulating the process of processing and using information;
3) informatics means consisting of protection programs and information encryption techniques.

The most well-known and used models of protection assurance (access authorization) are:

1) The Hoffman model, consists of a set of rules relating to 4 types of objects - users, programs, terminals and files, each with 4 security features:
   a) authority (non-secret, confidential, secret, top secret);
   b) category (specific data grouping compartments (limited access, approval access));
   c) right (group of users, who have access to a particular object);
   d) regime (crowd of object access modes: read, update, run program).
2) The Kent model has 5 dimensions: power of attorney, users, operations, resources, situations. Contains a process of organizing access well defined by an algorithm. Access to data is considered as a series of requests by users for operations to resources at a time when the system is in a certain state [2, pp. 176-183; 4, pp. 20-224; 6, pp. 134-156].

5. Conclusions

1) Place, role and functional value in the unitary economic management process dictate the primary concern for the protection of information on informative content.
2) Such an approach is justified by the fact that informative data constitute the consequence of the evolution of material processes and the basis for obtaining decision-making products. Therefore, their quality depends on the formulation and decision-making, which directly influences the material compartment.
3) At the same time, the isolated protection of information units alone does not ensure the full level of performance of their quality, because in addition to protection, this essential parameter influences the means, methods and resources involved in processing the values of these units.
4) For the reason given, full information protection requires it to be elucidated in interconnection and interaction with the means and methods of protecting other informatics resources.
5) The complexity of the composition, the unimaginable volumes of informational and informatics resources, caused by the objective course of the processes of globalization of human material and spiritual activities, have led to the complication and aggravation of the issues of protection and efficiency of E.Ic.S.
6) In addition to this phenomenon, the issuess in question are also caused by the following significant influence factors:
   a) the unsatisfactory level of the operating parameters of the technical means of information, of decisive value having the informational and informatic media, as well as the display devices;
   b) the tendency towards private ownership of information, as each user claims to their own informational resources;
   c) the legal value of economic information, which requires a high degree of authenticity;
   d) like any other information, economic information is not consumed, which is why the loss may lead to the impossibility of its recovery;

e) the primitivism of the reliability and security activities of E.Ic.S., the systemic organization of which is at the initial stage.

7) As the practice of the functioning of E.Ic.S. in economic units evolves, it is increasingly necessary to demonstrate the obvious specialization of informatics services in the form of certain organizational subdivisions, rarely being carried out as services for the protection of informational and informatics resources, mainly in the banking, state, internal affairs sectors.
8) From the positions of integration into a unitary whole and analogous functioning, the existing structuring of the economic managerial process (fig. 2) is caused by the following essential factors:
   a) excessive dispersion into space and discrete expressive functioning over time, the latter being primarily caused by the insufficient degree and primitivism of carrying out human material and informational activities;
   b) significant expansion of territorial dimensions and shortening of time limits for human material concerns;
   c) respectively, and the informational occupations, which are objectively imposed, therefore, undetachable by material ones, in its evolution have transformed from the area of concern of a subject (group of subjects) to the field of interest of society as a whole.
9) The exit from the created situation and the prospect of the permanent performance of the elucidated domain can take place by creating and applying means and methods based on the principle of integration.

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Rezumat

Sunt elucidaţi factorii imperioşi, caracterizate circumstanţele şi mediile sistemelor informaţionale şi informatice economice actuale şi de perspectivă, care în mod obiectiv au contribuit la necesitatea stringentă de invenţie, elaborare şi utilizare a diverselor mijloace şi metode de protecţie a resurselor informaţionale. Este accentuată valoarea funcţională a domeniului în cauză în mediul economiei de piaţă şi a sistemelor informatice integrate. Conţinutul materialului este structurat şi redat de pe poziţiile procesului unitar de gestiune economică, care realizează nu numai activităţile informaţionale, dar şi materiale în interconectare şi interacţiune nemijlocită în regim de timp real. Sunt specificate subdiviziunile lui şi în această bază - determinat domeniul aplicării sus-

numitelor mijloace și metode în condițiile existente ale procesării valorilor informaționale de conținut informativ. În contextul dat sunt sistematizate și analizate sub-diviziunile procesului anterior nominalizat, constituentelor lui. Este stabilită și elaborată schema generală a interconexiunii și interacțiunii dintre parametrii protecției și eficacității funcționării sistemelor informatice integrate economice. În dependență de mediile aplicării, sunt evidențiate categoriile protecției unităților informaționale, fizic realizate sub formă de date, pe mediile memorare manual și informatic. Concomitent, în plan de influență reciprocă cu resursele informaționale, sunt elucidate unele aspecte ale protecției celorlalte resurse informatice. Tangențial, este examinată terminologia și efectuată concordanța mijloacelor și metodelor de organizare și realizare a proceselor protejării datelor. Sunt formulate problemele acestui compartiment al informaticii economice și posibilele căi de soluționare a lor.

***Cuvinte-cheie**: categorii, concordanță, mijloace, metode, probleme, terminologie factori, protecția datelor, sisteme informatice integrate*

Аннотация

Рассмотрены настоятельные факторы, охарактеризованы обстоятельства и среды существующих и перспективных информационных и информатических систем, которые объективно привели к насущной необходимости в изобретении, разработке и применении различных средств и методов защиты информационных ресурсов. Выявлено и подчеркнуто функциональное значение данной предметной области в среде рыночной экономики и интегрированных информатических систем. Содержание материала структурировано и изложено с позиций единого процесса экономического менеджмента, реализующего в реальном режиме времени, то есть, в непосредственной взаимосвязи и взаимодействии, не только информационные, но и материальные действия. Специфицированы подразделы данного процесса и на этой основе определена область приложения вышеназванных средств и методов в существующих условиях процессирования информационных значений экономического содержания. В этом контексте систематизированы и анализированы его подразделения, их составляющие. Определена и разработана общая схема взаимосвязи и взаимодействия между параметрами защиты и эффективности функционирования интегрированных информатических экономических систем. В зависимости от среды применения, выделены разновидности защиты информационных единиц, физически реализованных в виде данных, на материальных пространствах ручной и информатической памяти. Одновременно, в плане взаимовлияния с информационными, рассмотрены некоторые аспекты защиты других информатических ресурсов. Тангенциально, уточнена терминология и установлено соответствие средств и методов организации и реализации процессов защиты данных. Сформулированы проблемы данного раздела экономической информатики и возможные пути их решения.

***Ключевые слова**: категории, соответствие, средства, методы, проблемы, терминология, факторы, защита данных, интегрированные информатические системы*

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