

## ***Contributory Aspects of Integrated Informatics Systems to the Impact of Globalization on National Economies***

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***Abstract:*** *The concept of integrated informatics systems, in the plan of bringing a decisive contribution to the integration of human material and spiritual activities, is revealed. The influencing factors on the performances of these activities are listed and clarified. The final purpose of the evolution of the cause systems is formulated. At the same time, the phases of their evolution are revealed and analyzed, with the establishment of the prospect of covering all material and informational processes (informative and decisional) by the informatics means and methods. Starting from the principle of their interconnection and interaction within the framework of a one fully integrated unit, at the national level, considered as a unitary material-informational nucleus, the conceptual composition is highlighted and the contributing aspects to the phenomenon of globalization in any spatial and temporal radius are elucidated, through the concordance of organization, structural and processing units of all the informatics resources. According to this approach and based on the existing and unpredictable degree of technical - scientific progress in the domain of applicative informatics, it is proposed to realize the explained systems in the form of automatic intelligent data bank.*

***Keywords:*** *informatics resources, integrated informatics system, intelligent data bank*

### **Introduction**

The spatial isolation and the discreet evolution of material (manufacturing, distribution (commercialization), consumption) and informational (informative, decisional) processes for the existing economic management system, which virtual and in analogue interpretation they form whole, are characteristic. From here there are multiple disparities between the activities of these two categories of activities (material, informational), the breaking down of the managerial system on management levels (bodies) (primary, intermediate, superior), operational periods (operative, current, prognostic) and of the information system on subsystems, complex and particular issues.

Such a situation led to the most expressive influence, especially at the managerial intermediate and higher levels, of the subject's role on the material and spiritual events of both the human society as a whole and each hers subdivision, individual. Have been created the conditions of favoring of prevailing negative tendentious impact of the managerial system over the driven object (process), as well as to the predominance of applied practically in any space and management moment of the administrative methods and means. From unitary positions, all these moments, with prevalence, are caused by the inadequacy of the performance level of the management subsystem comparatively with the derived subsystem. The formation of the mentioned breaking off has occurred once with the establishment of the social character of the human material activities, as a consequence of the qualitative information shortage.

The analysis of the unfolding of course of these two constituents of the unitary economic management process revealing in transparence the objective going, but until unconscious by the subject, towards the liquidation of the territorial isolation and the discrete function of them. At present and from the beginning of the socialization of the subject's activities, such advancement is observed and is accomplished by inventing, elaborating and applying of the various technical, programmed means, technological methods, and so on, considered as informatics resources. By drawing a parallel between the progress of the development of elucidated resources, it becomes perceptible the fact that the above

mentioned essentially have advanced, while, from the point of view of the complete inclusion of the information phenomenon as an integral unit, their application in the economic informative and decisional fields is insufficient. In this sense, it is certifying the satisfactory coverage by the informatics means and methods only of a transformative stage of the information - the processing (information, structural, calculation) stage, the other two stages - initial (of the formation of the primary and intermediate values) and of using (analysis of information products and based on the results of this analysis forms of decisions), remain mostly conducted manually by the subject. As a result, there has been a substantial disagreement between the levels of performance of the informatics methods and means and level of their application domain - information. This situation can be qualified as an unpreparedness of the information resources for the involvement of the nominated resources in their processing. The created circumstances are caused by the major spatial expansion and the unimaginable speeds of achieving human material preoccupations. Taking into account this confessing, the evolutionary formulation of the concept of globalization causes activities, which are objectively pushed by the imperative of the material - informational integration. Otherwise affirming, the material globalization has provoked and cannot be achieved and operated without the informational globalization.

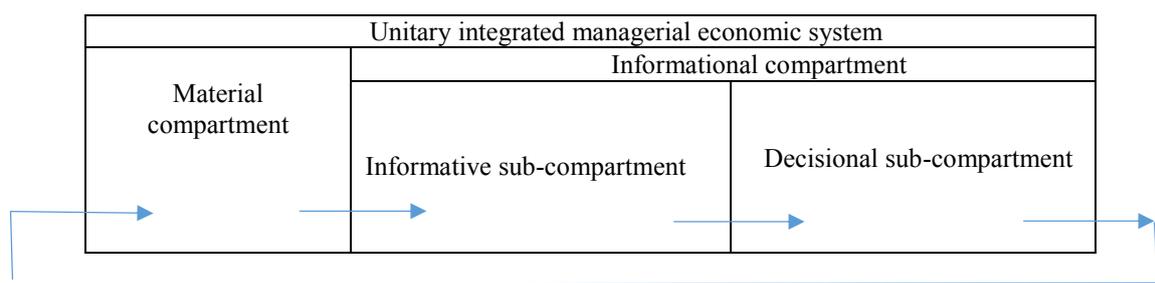
It is worth mentioning that at the moment and permanently, the listed above informatics resources rightly and justifiably are considered to be decisive in the data processing. But not less valuable for this way is the suitability of structuring and organizing of the information resources, their processing and functional (of serving of management functions) interconnections. The consecutive accomplishment of these two categories of interconnections, starting with each problem and finalizing with the information system, ensures the continuity of all information processes. In the case where continuity is supported by technical means and methods, it is automatic. That is why, not only the informatics factors, but also the domain in itself - information resources, its rational structural interconnections, efficient organization and processing directly contribute to their mechanically processing. Therefore, the decisive importance in supporting of the automatic functioning of integrated system of economic management disposing the identification, respecting, putting in working and guaranteeing of the technical functioning of any variety of interconnections and interactions within the framework of named system.

### **1. Conception of the Integrated Informatics System (It.Ic.S.)**

The concept of the integrated informatics system resides in the including with informatics processes, in direct interconnection and interaction, not only of the informational activities, but also materials. The unity of this system refers to both the organization and the structuring and functioning of all its constituent elements from unitary positions.

Such of approach requires the effectuation of the elaboration, implementation and assurance of its daily evolution by establishing and realizing all the constituents, interconnections and interactions between them, regardless of the spatial and temporal radii, based on the principle of motivation, according to which the matter causes the information, the last being informative and decisional predestination.

In addition to the ones above mentioned, at once with the exactly and fully determination of the mentioned characteristics, the precisely respecting and their realization through the informatics factor, it creating the conditions for constitution of a economic management system of analogous action, that is, automatic and not automated, what is proper for such systems at present. In this situation, the system will operate according to the following scheme in figure no 1.



**Figure no. 1 Conceptual scheme of functioning of the integrated unitary process of economic management**

The presented in this scheme structuring is caused by the following essential factors:

- a) the diminished level of performance of the means and methods, which are invented and applied in the processes of carrying these activities;
- b) excessive dispersion in space and time, the latter being caused primarily by the insufficient degree and the primitivism character of performing human material and informational activities;
- c) the significant extension of the spatial dimensions and the shortening of the temporal terms of the human material-informational concerns;
- d) respectively, and the informational occupations, which are objectively imposed, therefore, inseparable from the material ones, in their evolution have transformed from a field of concerns of a subject (group of subjects) into an area of interest of the society on the whole.

## **2. The Necessity, Importance and Contributing Factors of It.Ic.S. on the Performance of Human Activities**

The importance and necessity of the systems in question are explained and founded by the following main circumstances and factors:

- a) the extremely considerable increase of the volume and the continuous complication of the composition of the economic information, conditioned by:
  - the extension of the space and the quantitative increase of the economic material activities, of the complexity of their structure, of the variety of resources, interconnections and interactions between them;

This phenomenon can be confirmed by many examples, but we will refer to the most significant ones. Thus, for example, according to experience estimates, it has been found that in the last decades the nomenclature of finished products manufactured has increased tenfold. If the description of the technical, mathematical and programmed resources of the first generation electronic computing machines (E.C. M.) required to be concluded only one volume, then in the same purposes for the E.C. M. of the second generation ten volumes it concluding, and for the M.E.C. of the third generation - one hundred volumes. The technical documentation of the modern jet plane exceeds its weight.

There is also the danger of the so-called "bureaucratic death" of the society, predicted by some scientists. Its essence is that not having full, timely and qualitative information in the entourage of the modern economy with exaggerated volumes and complexities is not excluded to drop its leadership. In this case, the real knowledge of the situation of the economic processes will become impossible, and their results will be unpredictable.

Such an affirmation is also known, according to which the increase of the volume of material production occurs in arithmetic progression, and of the informational volume - in geometric progression.

The market economy contributes not only to the continuous increase of the volume and the complication of the composition of the economic information, but also it introduces new demands and

restrictions regarding its quality, conditioned by a certain degree of authenticity, opportunity, analyticity, fullness, flexibility and so on. This is explained by the intensification of the direct connections between the economic agents, practically unlimited in space and time, by the decisive role of the external relations and the acute need for permanent report regarding the material and financial situation of the suppliers and beneficiaries;

- acceleration of economic processes, also confirmed by various examples and experience. If in XIX century the period between the moment of invention (discovery) and the moment of accomplishment (implementation) they constituted 25 years, in the XX century. - 15 - 20 years, then at present it constitutes 2 - 3 years.

In the last few decades the speed of performing many processes, including the melting of the steel, its processing, has increased of 2 - 3 times.

All these circumstances have led to the need to carry as possible as frequent, through and detailed economic records, forecasts and analyzes of the state and evolution of economic processes.

As a consequence of the above mentioned, it is obvious that such a situation was created when, on the one hand, the volume of information increased excessively, its permanent composition becoming more and more composed, and, on the other hand, it is necessary that this information be obtained as operative as possible. The exit from this deadlock, as and in other fields, was found by the invention, the production and the en mass implementation of the technical means in the economic informational activities;

**b)** intensive invention and en mass implementation of the respective informatics technology for the automatization of economic information processes.

It is necessary to emphasize that in the economically developed countries the "informatics industry" by far has surpassed the indications of other branches of the national economy. For example, in the US and other advanced in these field countries, annually, computers and other computing equipment its commercialization in the amounts of tens of billions of dollars, which constitutes 15% of the capital investments for the development of new technology and technologies.

In order to perfect and increase the number of implemented informatics systems, hundreds of billions of dollars are allocated in the US. The share of resources allocated annually for these purposes in the US in overall product increased from 2% in 1970 to 5% in 1980, and later it increased even more considerably. In order to compare, we will find that in the same year the share of consumption in the global product of the USA in agriculture constituted 3%, and in the extractive industry - 2.7%. According to American expert estimates, this trend was maintained in the 1990s, and the consumption of the informatics industry reached 13% of the national global product;

**c)** increasing of the labor productivity of workers' in the field of economic management. It refers, above all, to the productivity of carrying out the processes of structural and calculation processing of information, because the other works ("acquiring" the initial data and using the result indices) are poorly automatized. Therefore, it would be more objective to compare labor productivity only in data processing (structural and calculation) processes. In this case it is sufficiently emphasized that if only a few hundred calculation operations are performed manually (180 multiplications, 600 assemblies per hour), then modern computers perform millions and billions of such operations per second. As it can be seen, in this chapter human and technical capabilities are incomparable. The same can be observed in other parameters (for example, 6000 characters per hour can be recorded manually, while the computer printer records hundreds of symbols per second).

Further on it would be useful to meditate on the fact that initially and even now, particular attention is granting to the labor productivity mainly in the material production, leaving on the second plane its management sphere. However, the experience of the advanced countries confirms that the automation of only the material processes, even and the most complete and efficient, at a given moment does not

ensure the advancement of labor productivity. The main reason for such situations is reduced to that, that the management system must be equaled to the level of organization of production, or to overcome it. Thus, the results of the production activities in a large measure depend not only on the level of their automatization, but decisive and of the progressive level of their management system. The culture of material production is conditioned by the culture of its management. Unfortunately, this correlation in the economy until it is not observed;

**d)** economy of human resources. This factor is found in direct relation with the previous factor, because its dimensions are conditioned by the level of labor productivity in the management sphere. It is characterized by the number of workers in the given sphere and their weight in the general number of the working population. In this sense, several data confirm that with the advancement of the culture and productivity of work in the field of material production, the number of workers in its area of management is increasing, which is considered a negative consequence. Moreover, in the beginning the automatization on of the management works, especially of the informational character is justified by reducing of the number of workers. In this connection, it is necessary to mention the existence of the objective tendency to increase the absolute number of workers in the management sphere. Because it has an objective character, it cannot be stopped and is considered a basic criterion of the efficiency of the society's informatization, but not the main one. The main predestination of the informatization of the economic processes consists in the quantitative and qualitative improvement of the results of the material activities. Therefore, the legality of increasing the absolute number of workers in this field will act permanently, but the essential is reduced to determining the optimal ratio between the number of workers in the productive and non-productive spheres for the existing level of material production and respecting (maintaining) this report.

About the increase of the number of workers in the management sphere objective confessing to us and the fact that, once the certain level of material manufacturing development is reached, which requires a high degree of training, it becomes difficult to find the border between physical and intellectual work. The so-called "deletion" of the physical content and the establishment of the intelligent character of the work take place. What just now is considered to be physical work is not excluded, as after to require certain intellectual efforts;

**e)** improving of the quality of economic information. Any information, including and the economic, is considered qualitative if it meets certain requirements, by respecting which it can be used in the management process. The quality of information is determined by such main criteria, such as authenticity, analyticity, opportunity and plenitude.

The sense of authenticity is reduced to the fact that the information must contain objective data, which would describe the situation of the economic processes and their resources as they are in reality. Because so far the process of economic management and to a large extent its informational content is realized by the subject, directly interested in the material and spiritual results, the danger of mystifying the values of the information units is not excluded. The basis of this mystification lays both subjective and objective reasons. The former have negative consequences and are explained by the unjustified interests of the subject to obtain certain material, financial and other categories goods, by increasing or decreasing of the values of the economic indicators. The objective reasons are explained by the considerable volume of information and works carried out on them, as well as by the mechanical nature of the latter, which lead to the user's fatigue and consequently - to commit certain errors.

In the environment of It.Ic.S., the negative influence of the nominated reasons on the authenticity of the information can be reduced to a minimum, because its processing is carried out not by the subject, but by the technical means, which being inanimate do not show interest in the obtained values of the resultant indicators. The excessive speed and extended memory capacities of modern computers also largely exclude committing errors caused by volume and exaggerated informational, structural and computational works.. Therefore, the weight of errors decreases essentially, and the quality of presentation, processing and including of information in It.Ic.S, it becomes incomparable with the manual one.

The analyticity of the information is characterized by its level of detail (concretization). The more detailed it is, the more voluminous the presentation of its values and consists of several signs. For this reason, the productivity of information processing is directly related to the dimensions of its presentation. Therefore, analyticity conditions the increase in the volume of presentation and transformation of information. In the manual data processing environment, labor productivity decreases in case of increased analytical information and vice versa. Therefore, it becomes increasingly difficult to ensure the necessary degree of detail of the economic information in the environment of modern material economic activities. Often it is resorted to various roundings and increases (decreases) of the values of the various economic indicators.

At the same time, in the environment of It.Ic.S. increasing the volume of data presentation does not influence the productivity of their transformation. Here is considered the functional aspect of providing data with decisions and not the physical one made inside the computer. It is obvious that in the latter case this influence occurs, but the exaggerated speeds of the technical means make it practically not noticed compared to the manual processing.

A third main qualitative criterion of economic information is opportunity. For the existing system of economic management, it is characteristic of the chronic delay of providing of the information at the time of need in them for to found the respective decisions.

And here the application of the technical means and the advanced technologies realized within Ic.It.S. it contributes to the pronounced acceleration of the informational works and, therefore, to the reduction of the terms of obtaining and providing the necessary information. Thanks to this fact, it becomes more operative and therefore the moment of obtaining it can be optimally coordinated and close to the moment of necessity in it.

The completeness of the information consists in the fact that both according to its composition and its content, it is necessary to comply with the requirements of certain foundations of management decisions. This primordial qualitative requirement of the economic information also becomes increasingly difficult to be fulfilled in the conditions of the permanent increase of the informational volume and of the data processing.

Overcoming this difficulty can also occur through the implementation of such means and methods, which would increase the productivity of labor in this field. The most efficient from this point of view are considered the exploited forms of various It.Ic.S. Informatics means.

**f)** the social aspect of It.Ic.S. is carried out in the following three main directions:

- the implementation of It.Ic.S. at any level and in any field of activity allows each individual to participate not formally, but real in the general process of leading of the country and the national economy as a whole. This is ensured by the fact that in the It.Ic.S. each person can have access to any information at any time, which contributes to the increase of the level of competence and, consequently, to his / her growing opinion on the economic processes, which is carried out not only in the area of the workplace, section, sector or the economic unit, within which it operates, but also at branch level and national economy. Therefore, the ideal It.Ic.S. will transform any worker in the sphere of material production and, even more so, in the sphere of management from a formal participant into a real one of the unitary process of economic management;
- gradually the It.Ic.S. will free the workers of the management sphere from an excessively voluminous work and of a purely mechanical character, related to the perfection and daily processing of the same information. As a result - more time will be used to analyze the content of this information and in this basis to formulate certain decisions and to track their realization. In this way, the creativity of the activities of the workers in the management field will be intensified. From these positions it can be seen that at the present stage the nominated workers fulfill, mainly, the function of informants, because almost all their activity time is consumed in order to obtain the information necessary to manage the object. In the case of the release of these workers of these works, and what that It.Ic.S. proves, the specialist objectively is put in the situation of the necessity of perfecting his own activity,

which consists in intensifying the processes of mental thinking and not of mechanical execution of some and the same works every day. Thus, the transformation of work from mechanical activity into creative activity takes place. Eventually, it will also be determined who of the current employees of the management sphere are able to continue their activity in this field or not. Consequently - the notion of management activity will be brought to a certain degree of correspondence not only by form, but also by content;

- implementation of It.Ic.S, in the daily human activity it will also contribute to the continuous improvement and development of the subject as a personality. This is ensured by his release from hard and mechanical work.. So, It.Ic.S it has consequences not only for his improvement as a specialist in the field, but also as a personality of the society. Free time can be used not only in the workplace, but also in order to obtain a lot of knowledge and skills in the field of social character - cultural, sports, music, art etc. For this reason It.Ic.S they will also contribute to the multilateral evolution of the personality.

The importance of the social aspect of It.Ic.S.it reduced to the following. As these systems will ideally lead to the total informatization of the society, the latter will have the following main consequences.

The economic management will not be as obviously architecturally built as it is today. It will be realized, or, better said, it will have possibilities of accomplishment at any level, starting from the work place of each worker and ending with the top management bodies (for example, government). This, however, does not mean that certain levels and management bodies, responsible for the results of the economic activity of certain objects, will disappear. In the form of some management system they will exist, however, the content and character of their activity will be much different from the current one. The difference will be conditioned first of all by the fact that, at any level, any decisions will be founded and taken with the participation of a considerable number of people, or even of the society as a whole.

Thanks of the total informatization and the level of competence of the society and partly of each individual, it will also become more and more all-embracing. Therefore, in the perspective the informatization it will increase to the ideal and the social level of development of each personality and of the society as a whole. As a result, through the informatics systems a new qualitative leap will be made in the evolution of human society. If previously such activities as reading, writing and calculating were considered the main signs of intellectual work, then in the present situation and later on the foreground, the ability to analyze, judge, superpose etc. is highlighted, so to think logically and adequately to reality. In order to ensure such broad, through and objective thinking, a considerable amount of knowledge from various fields is required, to which contributes the total informatization.

Currently, the It.Ic.S ensures the increase of the calculation capacities of the management system, contributing to the increase of the volume of processed information and of the performed operations, to the increase of the accuracy of the values of the calculated indices, the increase of the operability and complexity of the situations of report, decision-making, and so on. All these taken together and in interconnection more and more bringing the decident to the material processes, leaded with the multitude of their positive economic and social aspects, which derive from these processes.

### **3. Trends and Directions of Evolution of Integrated Informatics Systems**

It.Ic.S. is considered as the decisive factor for achieving the technical-scientific progress that has common characteristics for any field of activity.

Generally, the technical-scientific progress evolves in three basic directions:

- 1) improvement of the technical means in order to reach their new higher operating parameters;
- 2) elaboration and implementation of high-performance technologies that would ensure a new stage in productivity and work culture;
- 3) the organization of modern forms of realization of new technologies and of exploitation (operation) of the technical means.

These directions are also characteristic for the field of informatization of the sphere of economic management. Therefore, based on the gained so far experience, modern and current scientific elaborations, not only in the information processes, but also in the materials (production), the following main directions of the continuous evolution of economic integration informatics systems (E.It.Ic.S.) can be formulated:

1) improvement of the technical base of It.Ic.S on the following paths of paramount value:

a) the extension of the functional capacities of the technical means, which is reduced not only to the creation of new means, but more to the endowment of the existing ones with new devices, or to the performance of the devices, which they currently have. For example, for economic problems with considerable volumes of the most inadequate information, even in the most modern computers, are the devices for entering and extracting (printing) data, internal memory. The first two devices are of electromechanically action and therefore their operating speed is incomparably low relative to the speed of the electronic action processor. Internal memory is always the main obstacle to using modern programmed resources, which requires large volumes of memory. In addition to this, and the informational assurance of economic problems is extremely voluminous;

b) the most intense use of the performing technical elements for the construction (assembly) of the informatics technical means until the most significant performances were achieved based on electricity processes. However, the technical-scientific progress and the achievements of the natural sciences (physics, chemistry, biology, etc.) show us possibilities to create such means not only on the basis of the elements that carry out the electrical processes, but also of another nature (light - laser, pneumatic, biological, etc.). The production of the informatics technique based on these elements will contribute to obtaining the incomparable performances with the existing ones;

c) miniaturization of the computing technical means, which contributes to reducing their size to such a degree, that them can be transferred in space without making essential efforts, use minimal energy resources and therefore can be exploited in any conditions and place application. This path of performance is directly related to the mass application of the physical elements, on the basis of which it is built. About such achievements also proves that if the E.C M. of the first generation occupied areas of hundreds of square meters, then most modern computers occupy the tens of square centimeters;

d) the maximum access in exploitation of the informatics technical means. Both E.C.M. from the first generation, as well as personal electronic computers (P.E.C.), require special training to use them in daily work. It is quite bulky and complicated, because it also depends on the composition and number of problems that need to be solved, on their complexity. Of course, the composition and the number of specialists and the complexity of the works with each generation of informatics technique will be reduced. But in the current situation, the implementation and utilization of even the most efficient computers requires a certain level of preparation and volume of time. Therefore, it is obvious that at once the access to the informatics technique is far from ensuring for any user of any category. Ideally, however, it would be necessary for its application to be as simple as exploiting the domestic technique (television, telephone, etc.). In this case, the need for certain training will decline and the nominated technique will become more and more accessible to any wish, regardless of profession and field of activity;

2) improvement of the technology of informatics technique production, based on the use of unified construction elements and automated assembly lines of conveyor type, rotor, etc. The realization of this direction has as a consequence not only the increase of the productivity of the production, the culture and the working conditions, but also the assurance of the compatibility of the technique in several points of view (mathematical, programmatic, technological, etc.). We have evidence in this regard starting with the E.C. M. of the third generation (in the former USSR - M.E.C. of ES ÁVM type, in the USA - IBM / 360, IBM / 370 etc.), and the production of personal computers is carried out only due to the compatibility of the constructive elements;

3) improvement of the functioning forms (units) of It.Ic.S by gradually transition from the organizational ones (computing office, station, center, automatized directing system (A.D.S.), and so on) to the technical ones (computing (informatics) networks). We are witnessing to such a phenomenon, when various computing offices, stations or centers are not more organizing, but at the same time new computing (informatics) networks, both local and remote (global) are implemented and

functioning. Virtually all It.Ic.S established in recent years have a technical basis in the form of computing (informatics, of computers) networks. This is explained by the organic nature of these networks, which ensures of the data distributed organization and processing, which corresponds to the economic management system with several levels and spatial rays. In addition, it ensures the automatic execution of the works and the natural combination of the informational processes with the material ones;

4) the as possible coverage with informatization of in complex and interconnection all sectors of economic information, which contributes to the following performances:

a) the construction and realization of the information system in a rational and logically conscious way. This takes place because the automatization of all sectors of the objective informatization system requires a full study of both the composition and the reciprocal links between different information units. Following of the study the information system is perceived as a unitary whole and built according to the given concept. For this purpose, not only the information components are detected, but also the reciprocal links between them, and subsequently analyzed, compared according to the various criteria and the most rational ones selected in terms of the composition and functioning of the information system as a whole;

b) the distributed collection, processing and using of economic information, which is most appropriate for the economic management system;

c) the maximum automatization of all the processes of transformation of economic information. Such performance is obtained based on the fact that most of economic problems (of calculations) are mutually informational conditioned, because the informational results of one or more problems can be used in the process of solving one or more other problems. Thus, in an information plan, one problem devolving from another and, therefore, by automating a complex of problems, it naturally contributes to the automation of problems that have information links with the automated ones. In this case, the results are stored in the computer's memory and when it is needed, it remains only to automatically transcribe them off one type of memory on another;

d) the maximum soliciting of the technical means, conditioned by the increase of the diversity and the volume of work, with the extension of the domain of application;

5) to intensify the training of specialists from different qualifications and scientific workers in the field of economic cybernetics and c informatics, as well as in other areas of tangential membership;

6) organization of institutions, sections and sectors of scientific research and design, as well as the formation of new branches of science on the problems of setting up and exploiting the different. The It.Ic.S. of computerizing the processes of economic information.

It should be emphasized that in the post-war period, as well as in present, no has been conducted the systemic research in the field of informatization of the national economy. Therefore, much remains to be done in this chapter, and the attitude and level of solving many problems belonging to the given direction practically depend on the fate of computerization of the national economy.

Therefore, the continuous performances of .It.Ic.S are conditioned by both objective (directions 1 - 3) and subjective (directions 4 - 6) factors. For this reason, the pursuit and achievement of the evolution of the in question performance requires the equal importance and attention to be given to these factors. Deep and concrete knowledge of the place and role of the E.It.Ic.S in the accomplishment of the economic informational activities, as well as of the general trends and directions of the evolution of their performances, they will contribute to the creation of the unitary system of manufacturing material, informational and decisional products, which will have a clear functional efficiency.

#### **4. Evolution and Perspective of Organizational Units of Daily Practical Achievement of Functioning of Economic Integrated Informatics Systems (E.It.Ic.S.)**

The fabrication of any product, (finished, semi - finished) or the achievement of certain activity requires the determination of the composition, succession and modality of effecting of the certain conglomerate of works. The maintaining, compliance and ensuring of the achievement of these three key factors becoming possible in the case of the elaboration, organizing and functioning of the certain technology, what, in its turn, relies on the some resources (human, financial, material), distributed and

used concordant of the necessities of their interconnections and interactions within the framework of unitary process oriented to obtaining a common result.

Daily realization of any technology requires the constitution, putting in action and ensuring of the daily effective functioning of certain organizational unit. In the domain informational economic activities such unit initially is considered right the “computing installation”, but at present – right the ”factory of manufacturing the information”. But, at the beginning and in present under this notion it understood not something else than the organizational unit of exploitation of the informatics technique.

The variety of these units and the succession of their functioning were conditioned first of all of the class of technical means (especially, of computing machines), on them basis they were organized. In its evolution such units are organized in the form of computing office, station, center, automatized system for the data collection, transmission and processing, the informatics post of the activity of specialist and network of such posts. The term „ factory of information” conventionality is motivated by the fact that in physical aspect such „factory” hasn’t worked separated from the social-economical units, permanently being in their composition. This once again abundantly confirms the right-fullness that the information is not being matter indivisible (if not merged) is linked with it, even and in cases where it is obtained not manually but automatically, with the application of various informatics technical means.

In its evolution the „factories of information” influenced diverse sights of economic informational domain, about which is talking the content of figure no 2.

N/o	The organizational informatics units of functioning of E.Ic.S.	The ray of covering of the informational activities by the organizational units of functioning of E.Ic.S.								
1.	Computing office	A.O.								
2.	Computing station	A.O.	S.P.							
3.	Computing center	A.O.	S.P.	I.P.	S.D.	P.D.	U.I.			
4.	Automatized system for the data collection, transmission and processing	A.O.	S.P..	I.P.	S.D.	P.D.	U.I.	M.F.		
5.	Informatics post of the activity of specialist	A.O.	S.P.	I.P.	S.D.	P.D.	U.I.	M.F.		
6.	Network of the informatics posts of the activity of specialists	A.O.	.S.P.	I.P.	S.D.	P.D.	U.I.	M.F.	M.S.	

**Figure no. 2 The evolution of covering of the economic informational activities by the organizational units, what ensuring the functioning of the economic informatics systems (E.Ic.S.)**

In figure no. 2 are allowed the following significations: A.O. – arithmetical operations, S.P. – structural procedures, I.P. – informational procedures, S.D. – standardized decisions, P.D. – procedures of obtaining of the values of the primary informational units, M.F. – management functions, M.S. – management system.

Not only the exaggerated increase in volume and the obvious complication of the composition of economic information, but also and the availability of informatics means and technologies, the latter being the consequence of the former, contributes to the adequate informatization of the human society. In such circumstances, a paramount importance has the organization of informatization on a scientific basis, first of all, thanks to the improvement of the human factor through full and qualitative training of users of any category. On this occasion, the following statement of cyber parent Norbert Viner is welcomed and memorable: "The computer is as valuable as the man who uses it".

Also, informatization would have been done scientifically, if it had reversed the concept of invention and application of informatics technical means. Till, of this kind some or others means above all are invented and only after that the domain of its application is studied. In our opinion, the concept would be much more efficient, when based on the establishment of the quantitative and qualitative parameters of the studied area, the respective technical means would be built, manufactured and

applied. Therefore, the realization of the informatization processes must be started and oriented not from means and methods towards the domain, but conversely - from the domain - towards methods and means.

At the moment, when we are dealing with the phenomenon of economic globalization, probably, we are finding in the threshold of the economic informational apogee of any human activity.

The beginning of this conventional apogee can be considered the period from the 60s to the 70s of the 20th century, when mass economic information was processed with the help of computing technical means.

As the application of these means, in essence, allowed the respective information to be processed (at first - only computing processing), the notion of informational (informatics) technology in practice it became aware, and in theory it crystallized. The latter, in turn, to be carried out daily required certain organizational units, in which, thanks to a certain distribution, which ensures certain interconnections and interactions between different resources, informational products were obtained in the form of economic synthesis documents, with certain content.

In the manual version, the organizational unit of realizing of informational technology is placed in dependence on the material economic potential of the managed object. Thus, in the beginning, when this potential was quite small and was realized by a single subject or by a group of subjects, all the information was "acquired", processed and used by a single person.

Gradually, during of the evolution of increasing of the volume and the complication of the composition of information, the manual mode led to different degrees of specialization in the form of various subdivisions of the economic management system.

Off these positions in ascending order the following evolution of the units of manual realization of the economic informational activities it establishing:

$S (In.S.) \rightarrow G.S. (C.In.P.) \rightarrow S.D. (In.F. (C.In.P.)) \rightarrow S.SD. (In.F. (C.In.P. (In.P.))$ ; where: S - specialist, G.S. - group of specialists, S.D. - subdivision, S.SD - system of subdivisions, and In.S.- informational system, In.F informational function, C.In.P - complex of informational problems, In.P - informational problem.

From the presented analytical formula, the tendency to specialize the informational activities depending on their functional content is evident, as their volume and compositional complication increases. If initially a specialist (S) entirely achieved the informational system (In.S.), then several groups of specialists (G.S.), each realized a complex of informational problems (C.In.P.), which were subsequently organized in certain subdivisions (S.D.) (such as accounting, planning department, standardization section, etc.), that each performs a informational function (In.F.). In it interior, the specialists can be organized according to complex informational problems (for example, accountants on record of material values, accountants on record of work and remuneration and so on).

At the last stage and predominantly until now the organizational unit for carrying out the informational activities is presented by a certain system (ordered conglomerate) of subdivisions, each of them fully or partially performing an informational function, within which the specialists in groups or individually are also organized on complexes, or on each informational problem.

From the aforementioned, it is requested the conclusion that at the same time as the complexity of the organizational unit increases, the more detailed branching (specialization) of the informational activities carried out within them occurs. It should be noted that for informational technologies the specialization takes place based on the functional content of the examined activities, without concretizing them up to the level of procedures and operations. This takes place in the case of the achieving of these technologies in the informatics organizational units, the evolution of which took place in the following order.

Initially, only the calculation operations were performed by technical means (at beginning –the addition and subtraction, then - multiplication and division), the other works being organized and performed manually. The organizational unit for computing operations was the computing office (C.O.), which usually falls within the functional information subdivision (for example, in the accounting composition). Technical basis of C.O was the keyboard computing machine.

Another organizational unit of this type, which followed the office, was the computing station (C.S.), being used with new-class of computing machines - perforation, automatically performing not only all the computing operations, but also - the data structural processing procedures.

The third evolutionary type of computer organizational units is the computing center (CC), which, apart from the structural and computing processing, also has the possibility to obtain (extract) the primary data directly from the material processes, to analyze the values of the informational products and making standardized decisions based on this analysis.

Essential extension of the "capabilities" of C.C. it is motivated by the much higher performance level of the new computing technical means, such as, the electronic computing machines (E.C.M.), the primary data technique (counters, transmitters, recorders etc.) and the technique of transmission, multiplication of information and so on.

The first two types of informatics organizational units (C.O. and C.S.) were informational isolated from the material environment for one's health of absence of the technique of obtaining, transmitting, accumulating and storing the initial data, as well as because the computing machines did not have devices for automatic data perception and input and information storage. At the same time, C.C. partially realized for the first time the connection of the physical with the informational processes. With a more weigh table of making this connection, the computing system (C.S.) is distinguished, which has more efficient automatic data exchange.

With the mass production and application of personal electronic computers (P.E.C.), favorable conditions have been created for maximum bringing the user of computing technique, which has also contributed to the establishment of a new modern computing organizational unit, such as the informatics post of activity of the specialist of the specialist (Ic.P.A.S.).

From the technical point of view, the Ic.P.A.S., for the first time, automatically achieved a the information connections between the P.E.C., thanks to their equipping with such a device, as the modem. Consequently - the organization of the physical data processing is performed in a distributed manner. So, the possibility of physical union of lots of P.E.C. at a distance, of course, led to the creation of the most suitable for the economic informational activities informatics organizational forms - the computing network (local or global). However, the lack of primary data technique and the limitation with the activities of one or several specialists until don't them allow to perform the works of obtaining the initial information and formulating the decision complexes, compared to C.C.

The main difference between the computing network (C.N.) and the network of Ic.P.A.S. (Ic.P.A.S.N.) consists in that the first one is oriented and marginalized by the content of the professional activities of one or the group of specialists. Lately C.N. and P.Ic.P.A.S.N. are considered and nominated the informatics networks (Ic.N.).

From those elucidated so far, it is obvious that, starting with such an organizational unit as C.C. not only informative but also decisional activities is automatically performed.

Such possibilities exist and at the computing informatics systems (C.Ic.S.), but their realization takes place discreetly. That's why Ic.N. are much more efficient compared to C.Ic.S. the last ones being realized of the E.C.M. of II and III generations.

For the full economic material environment, the automatic realization of the informational stages (informative and decisional) will be produced in the case of the reliable establishment and functioning of the automated (or automatized) management systems (S.At(z).M.S.), which are fated to cover not only the standard decisions, the complexes of such decisions, but also the functions and the management system as a whole.

The automatized management system (Az.M.S.) performs the same activities as the automatic one (At.M.S.), only discreetly. That is why the latter is a unit of perspective. Physically it will be realized by the constitution and putting into operation of the various physical models (chemical, biological and so on), which by them to the full automatic connection will be made both the material and the informational (informative and decisional) part of the unitary process of economic management. In this situation any managed object will be transformed into a unitary interconnected and interacted materially - informational (informative and decisional) nucleus, which is the ideal of any management system of material activities.

Analytically, the chain of evolution and perspective of the informatics organizational units, with the indication of the technical basis and the extension of the ray of informatics accomplishment of the informational activities is presented in the following way:

C.O (C.K.M.; A.O.) → C.S (C.P.M.; A.O., S.P.) → C.C. (E.C.M., D.P.T., D.T.T.; A.O., S.P., O.I., U.I., S.D., D.C.) → Ic.P.A.S.N. (E.P.C., D.T.T.; A.O., S.D., UI, S.D.) → E.It.Ic.S (D.T.T., D.P.T., E.C.M., P.E.C.; A.O., S.P., O.I., U.I., S.D.) → C.N., IcP..A.S.N., Ic.N. (D.T.T., D.P.T., P.E.C.; A.O., S.P., O.I., U.I., S.D., D.C., M.F.) → At (z).M.S. (D.P.T. D.T.T., P.E.C., U.I.T; A.O., S.P., O.I., U.I., S.D., D.C., M.F., M.S.) → U.A.M.I.N. (In.F.M.; M.S.); where: a) informatics organizational units: C.O. – computing office, C.S. - computing station, C.C. - computing center, C.Ic.S. - computing informatics system, Ic. P..A.S. – informatics post of activity of the specialist, C.N. (Ic.P.A.S.N., Ic.N.) - computing network (informatics posts of activities of specialists network, informatics network), At (z).M.S.. - automatic (automatized) management system, U.A.M.I.N. -unitary automatic material-informational nucleus; b) the technical basis of the informational organizational forms: K.C.M. - keyboard computing machines, C.P.M.- computing perforational machines, E.C.M. - electronic computing machines, P.E.C. - personal electronic computers, D.P.T. - data primary technique, D.T.T. - data transmission technique, T.U.I. - the f using the information technique, In.F.M - informational physical models;

c) area of informatics realization of informational activities: A.O. - arithmetic operations, S.P. - structural procedures, O.I. - operations for obtaining the initial information, U.I. - procedures for using information, D.S. - standardized (typified) decisions, C.D. - complex of decisions, M.F. - management functions, M.S. - management system.

In this way, the informatics organizational units have evolved and will evolve from the computing office to the unitary automatic material information nucleus, their technical basis - from keyboard computing machines to the physical information models, and the area of information activities with informatics means and methods - from arithmetic operations to the management system.

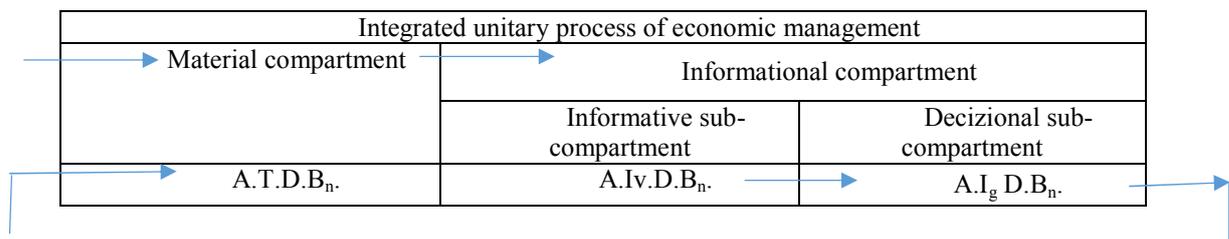
From the point of view of the exploitative performances (the technical potential) and the degree of comprehension of the unitary economic informational process, the evolution of these units confirms the fact that, if so far, the information "dressed" the coat of the technique, or, more precisely, the technique "dictates" the way of the information organizing and processing, then at present we are witnessing of the beginning of "dressing of informational coat" "by the technical means, or rather styled, the information influences the composition and structure of the technique, which confirms the higher level of development of the latter.

The in-depth knowledge of the role and place of the informatics and manual organizational units, as well as the tendency of their evolution, will contribute to the establishment and functioning of a unitary system of automatic manufacturing of material, informational and decision-making products with ideal performance efficiency.

## 5. Realization and Conceptual Functioning of the Integrated Informatics Systems (It.Ic.S.) in the Form of an Automatized Intelligent Data Bank (A.Ig.D.Bn.)

Based on the existing level, the foreseeable perspective of the technical-scientific progress, the synergistic character of the human material-informational activities, the degree of informatics achievement of the latter, justified is considered that the A.Ig.D.Bn. is the most opportune form of realization of It.Ic.S., Such a finding and conceptual approach is founded on the fact that this bank automatically performs, in interconnection and interaction, practically almost all the procedures and operations of information processing, and in some cases - and of the material ones - informational, taken as a whole.

Starting from the in question considerations and according to the general scheme of functioning of the unitary integrated process of economic management (figures no.1), it becomes obvious that at present this process needs to be realized conceptually according to the scheme of figures no.3:



**Figure no. 3 Conceptual scheme of operation, place and coverage rays of A.Ig.D.Bn compartments of the integrated unitary process of economic management:** A.T.D.Bn.- automatized technological data bank; A.Iv.D. B<sub>n</sub> - automatized informative data bank; A. I<sub>g</sub> D. B<sub>n</sub> - automatized intelligent data bank

The varieties of above presented data banks are motivated at present not so much by the categories of economic activities (material, informative, decizional), but by the level of the existing means and methods that carry out these activities. At the same time, the differentiation of the listed activities is not negligible, as without it the possibility of knowledge, study, analysis, their performance and, therefore, and their optimal achievement through the most productive processes and technologies disappears.

Another particularity and the most essential and decisive of this kind of processes that justify and explains why their division into the three categories is that they are dispersed in space and time, the latter (dispersion) being caused primarily by the level and character of human material activities. If at the initial stage of the evolution of the subject the area of material concerns was marginalized by the physical and intellectual potential of a person or a group of individuals, then gradually, according as the level of human possibilities ascending, such concerns their spaces and temporal terms. extended Respectively, and the informational occupations, which are objectively imposed and, therefore, inseparable from the material ones, have transformed from the field of works of a subject (group of subjects) into an area of interest of the society as a whole. As the last one (the society) is organized by lots of individuals, which performing a lots of processes with the lots of pronounced diversity resources, of which any social environment is interested (something else, if this fact is awareness or not), from unitary positions it imposing the ensure of their interconnections and interactions in the rays of contributing to attainment of the preliminary proposed goals. In the situation that was created, depending on the level, the volume, the variety and the complexity of the material activities, concomitently, both the structural informational units and the forms of their organization and functioning are compositionally evolved.

At the level of functional compartments of the unitary economic management process (U.e.m.p.) fully realized in a informatics (automatically) way, the interconnections and interactions of their components, schematically are presented in figure no. 4:

A.Ig.D.Bn.of achievement of the unitary process of economic management (U.p.e.m.) (Informational compartment - I <sub>1</sub> .C.)			
Programmatic sub-compartment (P.Sc.)		Informațional sub-compartment (I <sub>1</sub> .Sc.)	
Economic expert sistem (E.E.S.)	Economic informative database management system (E.Iv.D.Bs.M.S.)	Unitary economic knowledge base (U.E.K.Bs.)	Economic informative database (E.Iv.D.Bs.)

**Figure no. 4 Conceptual scheme of interconnections and interactions of the components of A.Ig.D.Bn for informatics realization of the unitary economic managerial process (U.e.m.p.)**

In accordance with the scheme in this figure, the constructive architecture of A.Ig.D.Bn consists of two resource compartments - the programmatic one (P.C.) and the informational one (I<sub>1</sub>.C.). In turn, P.C. includes two categories of components, the first of them (P.Sc.) manipulating with the programmatic data (E.E.S., D.Bs.M.S.). Respectively, an I<sub>1</sub>.C consists of two categories of information resources, one of them (U.K.Bs.) being presented by complexes of decision-making information units (complexes of rules – CR and decisional products – D.P.), and another (Iv.D.Bs.) - of initial informative data complexes (Iv.D.C.) and complexes of informative informational products (I<sub>1</sub>.Iv.P.).

In such circumstances, the automatic operation of A.Ig.D.Bn starts with the interaction E.S. → D.Bs.M.S. (1), then follows D.Bs.M.S. → Iv.D.Bs (2), as a result of which Iv.D.C regarding the concrete application is recovered, processed, for so finally the necessary informational informative product (I<sub>1</sub>.Iv.P.) it be so obtained. Further on through D.Bs.M.S. (3) the I<sub>1</sub>.Iv.P is offering E.S. (4), which involves programmed resources and the complex of rules (C.R.) of the U.K.Bs formulates the necessary decision-making product (D. P.) (5).

### Conclusions

1. It.Ic.S includes all the processes and resources of the economic organizational unit in direct interconnection and interaction between them.
2. This system is of analogous action, it operates in real time regime, regardless of the dimensions of the spatial and temporal rays of activities of the objects and the evolution of them resources.
3. Conceptually it can be approached from positions of material-informational unitary nucleus.
4. Starting from the existing level of the technical-scientific progress, It.Ic.S it can be partially automatically realized in the form of an automatized intelligent data bank (A.Ig.D.Bn.).
5. In such conditions, the national continental and world economies virtually will form a single "enterprise", with absolutely operative regulation. Thus, all territorial barriers will be eliminated, the need in administrative management methods will declining.
6. The influence of the subject will be reduced at the bringing of the system into the initial functioning situation and ensuring the necessary positive evolution for the prosperity of society and each individual.
7. In order to avoid the influence of the negative factors, some absolutely reliable systems of protection from of subjective interference and the involvement of the predictable and unforeseeable events of objective character are required.
8. It.Ic.S. it evolves and will evolve in the following three phases: a) accomplishment exclusively of the informational activities; b) direct interconnected and interactional realization of the material-informational activities; c) ensuring the climbing to a more higher level of development.
9. The automatic level of establishment of It.Ic.S will be produced on base of the compositional, structural and functional integration of each and all informatics resources.
10. Such a systems is of perspective and therefore the objective will be imposed when the functional value of the informational resources will prevail the value of the material resources, which will require new scientific and practical efforts in the field of them elaboration, implementation and operation.

### **Supplementary recommended readings**

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