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A Conception on the Dynamics of Informational System Implementation

This paper describes some special requirements involving the time-space context in implementing the informational systems. A so-called "precedence law" is determined which relates the time context and the space context of the developing global informational system.

It is well known that in the field of informatics, the basic concepts which would allow the organization of this branch of activity as a distinct part of science have not yet been fully crystalized. Having proliferated a considerable number of techniques of data processing, of analysis and designing of information systems, informatics tends to be considered as a "top technique" useful to various sciences, or to be subordinated to a more general and independent concept, that of an information system, in this case, usually considering the economic information system, by extension, the economic science.

The different character of the results and discoveries in the field of information systems and informatics is partly due to the lack of a framework, of some necessary delimitations for rendering a unity of content but also of expression to problems.

One of the possible ways for achieving such delimitations is that which starts from a larger outlook on the information systems both in time and space and which, by outlining some of their characteristics and dynamism, leads to the implementation of the present concept of information system.

The present study aims to make some contributions in this respect, raising for discussion several characteristics of the concrete existing informa-

tion systems in the Socialist Republic of Romania and, dwelling on the informational systems and the informatic systems in enterprises.

This discussion might start with what might be called delimitation in time. Synthetized in one sentence, this delimitation in time could be visible if we asked ourselves, for example, "is the fourth generation of electronic computers being implemented, but, which generation of informational systems we have today?".

Thus, we might notice that the information system seen as a coherent, articulate system for the production, transmission, processing and utilization of data has its origin in the informatic activities based on manual processing (Of course, the word informatic has in this case the meaning of data processing).

We thus outline "the 1st generation" of information systems.

The evolution of these systems has led to the necessity of a greater productivity of data processing. The characteristic of this stage was thus the "mechanographic" processing (sometimes, even electronic), accompanied, however, by a number of complex evolutions of the information mechanism itself concretized in the centralization of data, the definition of synthetic indicators, the appearance of the circulatory system of the information system (in which the functions of checking and validation of data and information, of updating and retrieval find their expression in the so-called "bureaucratic" apparatus).

Essential in the third generation of information systems is the appearance of the electronic computer which takes over from the functions of the informational system a considerable part of the decisions. In the information system of the third generation, the electronic data processing (the informatic system) holds a central place, the main requirements being the speed of processing and elaboration of decisions; the organization of data raises rather problems of elementary informatic techniques than a problem of information system. It is essentially supposed that the organization of data, according to the second or even the first generation functions completely and constitutes no problem.

Finally, in the fourth generation of informational systems, the organization of data is the main problem which is taken over by the computer together with their processing and the elaboration of decisions. What should be mentioned here is that the function of data organization, the main function in the information systems of the fourth generation, revolving around a data base controlled by the electronic computer, *is taken over from the previously existing system* which organized the data, thus the one of the second generation, which we abusively called "bureaucratic", keeping from this adjective only the idea of particularization, order, coherence and mechanical correctness both of data and of methods.

To pose the problem in this way, this delimitation in time of the concept of information system could allow a better understanding of the pre-

sent difficulties for the implementation of the modern information systems with data base and informatic systems. The essential mistake which is thus obvious is that a modern information system (of the fourth generation) is often built and implemented *on the unconsolidated, weak bases of an informational system of the second generation*, or of an information system of the third generation.

The fetish worshipping of the computer is partly at the origin of such flagrant mistakes. The computer "solves everything" they say forgetting that this "everything" will have to be somehow organized, defined and explained by man and only by man and that to this purpose the actual functioning even for a short period of time of an information system of the second generation (without the computer) is strictly necessary.

Other causes, specific of the situation in our country derive from the marked dynamics of the information processes closely linked to the extraordinary economic dynamics but also to the social dynamics and not in the least to the legislative dynamics.

This clearly implies the necessity of reducing to the minimum possible the halting stage of the information system in the stage corresponding to the second generation, the drastic reductiton of the phenomena of bureaucratism (in this last sense, the point in question is about what is usually meant by bureaucratism, that is its excess — redundancy of data, mechanic correctness up to formalism, the non-integration of informational techniques in time, etc.).

Resulting in noways from these implications is the fact that an information system before being centred on an electronic computer either as regards techniques (third generation), or as regards methods and data (fourth generation) will have not to function, in detail *under complete human control* in the manner of the second generation, namely in a "mechanic" order, coherence and correctness. This aspect should be well outlined because its non-observance undermines, as a rule, the implementation of the modern informational systems.

Another delimitation, the delimitation in space of the informational systems in our country must start from the necessity of recognizing a different qualitative structure of the information systems at various economic levels. It seems that in the informational domain, owing to the elusive aspect difficult to grasp in images and in intuitive sockets, it is very hard to understand the fact that the big quantitative transformations cause essential qualitative changes. Whereas in the industrial field, one easily admits for example, that the production of an ocean liner of hundreds of thousands of tons represents not only a simple quantitative translation from the manufacturing of a ship of scores of tons, but, also a huge qualitative leap, in the field of information systems, "global" information systems at a macroeconomic level are easily conceived, with the methods and concepts specific of the enterprise (for example: a single data base for enterprise engenders the "single" data base of the national economy!, etc.).

Therefore, a conception effort is strictly necessary for establishing clear delimitations between the information systems at an enterprise level, at the level of the industrial group, at a territorial level, at an economic branch level and at an all-country level. The first stage consists in defining and implementing the modern information system of the economic enterprise and only afterwards, building gradually the macro-economic modern information system, based on the essential components, gradually built at higher levels. The main confusion lies here in the fact that no clear distinction is made between *the modernization* of the macro-economic information system and *the building* of the macro-economic modern informational system. While the action of modernizing possibly to be achieved downwards concerns *the preparation* and facilitation of the introduction of a modern information system — the building of a modern informational system at levels higher to the enterprise will have to start with the basic components (the enterprises) just as any assemblage product will have to start with the component products.

The different qualitative structure of modern information systems surpassing the enterprise level is characterized by the different implications brought by teleprocessing and the computing system networks, a fact which is not entirely understood.

What, however, is less obvious is that owing to the increasing implication of decisions, as we pass from an enterprise level to higher levels, the information systems tend to pass under human control.

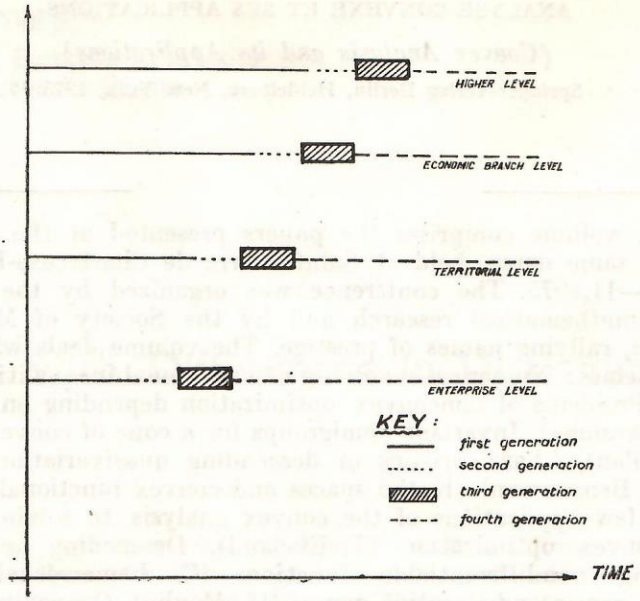
This results in the fact that information systems of the first generation are functioning at the highest level, entirely under human control due to the huge responsibilities appearing here, at the next inferior level, information systems of the second generation (it should be mentioned that the techniques and data are controlled by man, even if some modernizations are partly made, inclusively the use of the electronic computer).

Finally, at a territorial or economic branch level, the electronic computer is present in the third generation of information systems (centred on methods — the computer fulfils the control of methods and less of the data).

Characteristic at the basic-enterprise level is the possibility for a rapid implementation of the information system of the fourth generation with the computer's efficient control of the data, of the methods and partly of the decisions.

The fact that along the time, the passing from the information systems of the first generation to those in the last generation was always made gradually, compulsorily covering all intermediate stages, leads to the conclusion that in generalizing the modern information systems at the level of the entire economy, this successive transition will have to be observed. This might be represented through the diagram:

All this leads to the conclusion that at present, in our country, the main direction of the efforts for research and activity to implement and develop the information systems is that of *the organic growth of the information systems at various levels*, by this meaning the observance of the



above established precedence relations, the improvment and consolidation of each type of information system before passing to an information system of a higher generation, the training of the human staff and the adequate preparation of the hardware and software sockets.

UNE CONCEPTION TOUCHANT LA DYNAMIQUE DE L'IMPLANTATION DU SYSTEME INFORMATIONNEL

Cet ouvrage décrit certaines exigences tout spéciales concernant le contexte temps-espace dans l'augmentation des systèmes informationnels. On détermine une soit-disant "loi de la précédence" qui rattache dans le développement du système informationnel global le contexte du temps au contexte de l'espace.

КОНЦЕПЦИЯ, КАСАЮЩАЯСЯ ДИНАМИКИ ПРИМЕНЕНИЯ ИНФОРМАЦИОННЫХ СИСТЕМ

Настоящая статья описывает некоторые специальные требования, касающиеся вопроса времени-места при применении информационных систем.

Авторы используют при этом «закон прецедентности во времени» который связывает вопросы развития информационных систем в целом с вопросами времени и места их применения.