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Nicolae Ceauşescu

Present Problems of Economists' Training

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The 50th anniversary of the first series of graduates in economics constitutes a foremost event in the history of Romanian higher education, in the training of the staff required for the administration and management of economic units and institutions, as well as in the progress of scientific research in the economic field.

While emphasizing the contribution of the Academy of Economic Studies to the up-building of a socialist society in our country, we must mention the presence of graduates of this Academy in all branches of national economy, in the central administration organizations and institutions, in economic units distributed all over the country.

They competently took part in the achievements which have ensured to our economy its present level and now participate in the elaboration and follow up of the fulfilment of plans aiming at the continuous raising of economic efficiency in productive activity.

Present time society, characterized by the sophistication, the magnitude and the diversity of productive forces, implies now the rapid knowledge of the proportions of social progress, above all in the decisive field of material production.

Production, i.e. economic activity, is characterized today by most complex, interconnected technological and economic processes, which are being developed at an ever increasing pace.

Simultaneously with production progress, the need for an accurate and operative knowledge of economic phenomena is also being intensified, with a view to provide most efficient and operative management methods.

In its capacity as main tool for exerting management, decision prescribes the existence of a complete, unitary and operative information system, able to supply the necessary elements for the most realistic decision making in management activities.

The mutual dependence between decision and action, whatever the management level is, imposes the availability of an upward-downward data and information flow, capable of achieving the permanent link between management and performance, with a view to accomplish both current and long term objectives. The existence of a high correlation between resources and objectives, the fulfilment of the objectives set forth through the optimal utilization of resources, are the basic elements of management activity.

Whatever the essence of decision, or the level of decision making, may be, decision must be the result of a thorough technical and economic analysis, based on the knowledge of objective realities, for the expected effects to be achieved and if they are not to oppose the established goals.

In the present stage of development, the increase of economic activity efficiency of material production is closely related to the uninterrupted improvement of management. In contemporary society, management is being converted in a science based on the introduction and application of the latest scientific achievements, first of all of mathematical methods and of economic cybernetics.

On the general background of the actual science impetus, of its assertion as a critical factor for the progress of human civilization, the whole lot of mathematical, cybernetic and automatic methods represent major scientific disciplines for the progress of a decisive sector of society, namaly material production.

The course of contemporary world economy, its present trends, certify the ever increasing utilization of cybernetic means of analysis and forecasting, of a huge amount of knowledge, concepts, methods and techniques made available by modern science, through the instrumentality of which man is consciously managing the material production process, economy.

Actual life and economic practice are thus more and more dictating the utilization of mathematical methods, of cybernetics and automatics, of modern computation means, as efficient tools for the improvement of economic processes management. All the more surprising — to say nothing more— appears then the behaviour of some people, who willingly or not, while not fully understanding the part which is to be played by the application of mathematics and cybernetics in economy and of the other new economic investigation methods and tools, display subjective attitudes, conservative and retrograde tendencies in science when tackling this kind of problems. The achievements and findings of other branches of modern science have a broad application in economy, in monitoring economic processes, not because it is "fashionable" to do so, but as a result of an *objective necessity* of increasing the efficiency of economic activity through its prediction, through scientifically substantiated decision making, leading towards the continuous improvement of economic activity.

Scientists, professors, specialists all over the world are now unanimously appreciating that among the scientific disciplines concerned with the knowledge, analysis, organization and directing of economic processes a promi-

nent place is held by mathematical methods, cybernetics, automatics, the theory of automatic processing of economic information.

World specialists, gathered in a number of international meetings, are firmly convinced that mathematics and economic cybernetics are ultimately imposed as effective research tools for the analysis of economic life, as valuable aids in the optimal directing of economic processes, in decision making.

By promoting a scientific management of the entire political, economic and social life of our country, the Romanian Communist Party is formulating and transforming the general vision on the future in an activity programme, for whose fulfilment it mobilizes the whole people's creative energies, thus bestowing an adequate importance on the part science is meant to play in the progress of our socialist society.

Emphasizing the importance and the role of mathematical and economic methods, of cybernetics and of computation techniques, Nicolae Ceaușescu, General Secretary of the Central Committee of the Romanian Communist Party and President of the State Council said, on the occasion of the Plenary meeting of the Central Committee of the R.C.P., held on December 21 to 23, 1966: "Among the new fields of contemporary scientific research, a first rank place is held by the science of economic processes management, of production and work organization. Management science has imposed itself to the general attention in numerous countries all over the world. High results are being obtained in production through the use of modern computation and automation techniques, of analytical tools supplied by the newest fields of mathematics, cybernetics and economic informatics."

These guide lines issued by the Communist Party leadership, have a tremendous scientific and practical significance. They constitute a powerful incentive for the stimulation of scientists, research workers and other specialists' creative activity, thus contributing to the introduction of modern computation analysis, prediction and management methods and techniques in economy.

In the general context of the Communist Party's concern for continuously improving the economic management and planning, for increasing the general effectiveness of the activity displayed in all fields, we must mention the prominent part played by economists and by economic higher education.

Pointing out the considerable role of economists in the application of modern methods in our country's economy, Nicolae Ceaușescu, General Secretary of the Central Committee of the Romanian Communist Party and President of the State Council, said: If we wish to have electronic equipment, tot put economy on cybernetic bases and production processes on chemical bases, we will not be able to achieve this goal without personnel having secondary and higher education."

In terms of introducing and applying mathematical methods in economy, economic cybernetics, informatics, the modern means of collecting, transmitting and automatic processing of economic information, the training of economists is characterized by new development and improvement trends.



The arrival of the Romanian State and Party leaders at the Academy of Economic Studies.

In the first place, economists must have a many-sided training, they must be able to use in practice the powerful stock of modern methods designed for the knowledge and analysis of economic processes, to employ the modern computation technique in the solution of economic problems.

Starting from the objective need of improving the methods of managing and directing economic processes, a prominent place is held in the training of future economists, besides the economic sciences, by mathematical methods, economic cybernetics, the necessary knowledge for the use of modern equipment designed for the collection, transmitting and processing of economic information.

The weight bestowed on mathematical and cybernetic training of economists constitutes a present guide line of higher education in almost all countries and, first of all, in economically developed countries.

Mathematics is largely employed in economy, since it allows the quantitative characterization, the rigorous substantiation and the accurate expression of the correlation between the various technical and economic data implicated in the productive activity. These data allow an accurate economic analysis, they substantiate the choice of optimal alternatives, they permit a more efficient use of the country's material and human resources.

It is well known that specialists have been engrossed with problems referring to the utilization of mathematical methods in view of drawing up plans, such as the balance of links among the various branches, with its two models — the static and the dynamic model — and their optimization through mathematical programming. The mathematical method designed for the plan elaboration through the instrumentality of the balance of links among various branches is highly significant, theoretically as well as practically, in order to know the mechanism of the formation of the socially necessary labour time demand, that is of the formation of value and prices. Based on this balance and starting from the objectives of increase and distribution of the social product, the quotas assigned to the production development of the various economic branches could be actually determined.

A great number of mathematical methods used in economy are based on linear and dynamic programming. The mathematical methods of linear programming for the optimal production tasks assignment in the various jobs are widely known, as well as the application of mathematical programming in the determination of the optimal range of commodities to be manufactured during various time intervals. The methods of the queuing theory are widely spread in organizing equipment repairs and in the control of machinery — the servicing tools at working places. Probabilistic and statistical methods are used in determining the safety stocks and the time required for the performance of certain operations, for which there are not yet technical time standards.

A special part is played by the advent and progress of cybernetics in improving and perfecting the science of management. The extension of cybernetic concepts from the biological area to the field of economy, of material production, where a first rank place is held by the theory of collecting, transmitting and processing economic information, of decision making and of control systems, has lead to the structuring of informatics and economic cybernetics.



Romanian State and Communist Party leaders during their visit in one of the electronic laboratories of the Centre of Economic Computation and Economic Cybernetics — Bucharest.

On the background of the continuous improvement of the contents of economic training, with a view to take into account the new elements recorded by science and culture, economy and society on a national and international scale, the foundation — initiated by the Communist Party and the Government — within the Academy of Economic Studies, of the Faculty of Economic Computation and Economic Cybernetics, is reflecting the practical requirements felt in our country.

While the technical revolution is increasingly evident due to electronic computers making possible production optimization, economic activity prediction, the elaboration of substantiated scientific decisions, the improvement of planning and management activities, modern economy needs well trained staff, capable of manipulating, on the one hand, the numerous available mathematical methods of economic process modelling and information systems analysis and, on the other, the modern computation techniques. This requirement of modern economy leads to the necessity of a higher training for the two categories of economists: analyst-economists or mathematicians-economists and economists specialized in data processing.

By further taking into account the existing actual practice on world-scale in the introduction of mathematical methods and cybernetics in economy, in the utilization of modern equipment, in data collection, transmitting and processing, in view of training such economists at the Faculty of Economic Computation and Economic Cybernetics, besides the Statistical department, two other departments have been set up: Economic Cybernetics and Economic Computation Mechanization and Automation.

The department of Economic Cybernetics provides for the training of economists specialized in economic processes modelling, in the analysis and design of information systems in economy, in the algorithmation of economic computation problems.

The economists specialized in economic cybernetics, frequently named in the literature "analysts", aim at utilizing modern methods for the optimization of economic activities. To this end they analyze and define the economic problems of enterprises, industries and national economy, within the planned objectives, with a view to solve them on modern computation equipment and above all, on electronic computers. The definition of these problems is made in logical and mathematical terms, by taking into account the parameters of electronic computers. This new specialization of economists is essential for the scientific management of economic activity, based on the utilization of electronic computers and on operative and complete information systems in order to substantiate management decisions.

Just like an architect who is drawing sketches and designs for the construction of a building, the analyst will have to elaborate diagrams and designs of the economic information systems in enterprises and aggregate works, in industrial centralized organizations and in banks in the entire national economy. In order to be able to accomplish his role as an "architect" of economic activity, the analyst will have a mathematical as well as an economic training, he shall know the potential capacities supplied by modern computation techniques.

Mathematical training is provided through the instrumentality of disciplines such as general and applied mathematics.

The training making possible the knowledge and analysis of economic processes is provided by theoretic economy, concrete economy for the management and organization of enterprises and by economic cybernetic disciplines. The analyst-economists further learn the concepts of the operating parameters of equipment designed for data transmitting and automatic processing, especially the electronic equipment.

At the department of Economic Computation Mechanization and Automation, the staff required for the programming and rational operation of modern computation equipment and, above all, of electronic computers, are trained in the following specializations:

— economic information mechanical and automatic processing;

— programming and utilization of electronic computers and other modern computation means;

— design and organization of economic information processing units and systems.

The role of the economist specialized in economic information processing could be compared to that of the technologist in an industrial enterprise. This specialist ensures the effective solving, through the instrumentality of modern computation equipment, of economic computation problems analyzed and algorithmized by system analysts.

The training and specialization, during school time, of students at the department of Economic Computation Mechanization and Automation is achieved through the study and learning of disciplines providing the necessary technical specialized knowledge in mathematics and economy. Technical specialized knowledge refers to the principles of operation programming and rational utilization of modern computation equipment for information collection and transmitting. In order to be able to use the entire computation technique, they thoroughly learn the bases of corresponding mathematics and technique.

The economist specialized in economic computation mechanization and automation must further know the principles of file organization, as well as of the organization of the economic information system in economic units, of information sources and recording, its transmitting and processing.

The improvement of the contents of economic higher education is a continuous activity, aiming at providing the economists with the necessary training, in order to be able to work in the real economic laboratories of enterprises, thus effectively contributing towards the permanent perfecting of the planning and management activities, in order to increase the efficiency of economic activity.