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Effectiveness of Control and Information In Management

Stanislav Simoncic

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September 1990

Effectiveness of Control and Information
in Management

Stanislav Simoncic

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ABSTRACT

This article presents a short Czecho-Slovakian view of applying new requirements in education toward the creation of a market economy. The article attempts to explain how complicated this restructuring of university studies will be. It specifically discusses the wastefulness of the past Communist regime - a regime which had constructed quite an unbreakable informational system in its management of the economy.

Additionally, the article discusses the centralism which such an informational system had created, and presents an overview of how that centralism might be rebuilt according to the needs of a market-oriented economy. The discussion begins with interpretations of other informational systems in other fields of human activity, and goes on to delineate between the needs of government bodies for global information and the needs of plants for concrete data on products, technologies, working environments, etc.

From this point of view, it is clear to see how various management systems meet managerial functions, similar to those of a national economic system, in various ways.

EFFECTIVENESS OF CONTROL AND INFORMATION IN MANAGEMENT

Associate Professor Stanislav Simoncic

A short Czechoslovakian view of a goal to apply new requirements in education of students for a new market economy, an example: Accountancy.

I. Theoretical Framework for Which the Students Are Preparing Until 1989 (a Few General and Special Questions)

   Information Support of the Management Process

   A. Definition of the Word Information

   B. Typical Information Systems Used in Czechoslovakia and the Bases of their Projection

   C. Management of National Economy in Czechoslovakia and Its Informational Support

   D. A Few Notes About the Practice of Auditing

II. Current Educational Preparation Within the College of Management of the University of Economics at Bratislava

   A. A Short History of the University and a Few Notes About System of Education in Czechoslovakia

   B. Graduate Study

      1. College of Management - Preparation Faces of Academic Specializations

      2. Number of Required Courses for Individual Academic Specialization (Curriculum) - For Example Accountancy (Table 1)

      3. Number of Hours of Accountancy Versus Other Courses for Individual Academic Specialization

I. "Steel" Theoretical Framework for Which the Students Are Preparing until 1989 (a Few General and Special Questions)

I will show in my short article, the complicated rebuilding of university studies in Czechoslovakia, of which I have illustrated only one, albeit ambiguous example.

Specifically, I refer to the rigid, centrally-managed economy of the past communist regime, which constructed quite an unbreakable informational system of economic management.

I wish to describe centralism through an informational system, which, in my opinion, American scholars and students, who are interested in Czechoslovakia, will be well-served to undserstand, especially in light of the rebuilding that country's informational system is currently undergoing.

I would also like to illuminate different prejudices which Czechoslovakia students and scholars may have formulated under the old regime, and which they may bring with themselves to the USA.

INFORMATION SUPPORT OF THE MANAGEMENT PROCESS

A. Definition of the Word Information

Information belongs to crowded scientific disciplines and the deepening specialization of science is influencing its interpretation. First, information is a philosophical category.

Information is a means to gain knowledge. In this meaning we should include everything which is allowing us to learn difficult phenomena and events, past, present, and future. With the development of society, social consciousness and the level of knowledge, there is a growing need for quality, speed and efficiency in information

processing. Information is fundamental in the management process. Managers are working with basic material. Infor-mation is also working material in other areas of human activity--from educational institutions to mass media. We now are spending more time with information in all professions. Every management function is closely bound with obtaining, processing and delivering information. Practically everybody in society is closely bound with this activity. Opinions as to the meaning of information are not uniform, not only among us, but in Eastern Europe as well. There are a lot of approaches which we could put in three categories:

(1) Quantitative approach

The first group strives to measure the amount of information. There are theories which express amount of information or decrease of energy in the process of learning or in management process. Its shortcoming is that it does not give an exhaustive answer to the question: What is information for management?

(2) Energy approach

The second group believes that all information is "brought" by some form of energy through a carrier of information and a signal, and its energy reaches so-called threshold intensity and is in harmony with the energy of the system. The basic question of these theories is the definition of minimum and maximum energy of the signal as carriers of information. Not even this group of theories gives an answer to the question: What is information for management?

(3) Interaction approach

The third group believes that the theory of reflection (i.e., the reflection of interaction and objective reality), is the base of information. These theories do not allow one to quantify the information process but best grasps the content and the conception of information and its usefulness for management.

Together with others I would say that information is connecting two organic sides: content of reflection and mode of circumstances of reflection. As a philosophical problem a question arises: Is information an independent substance? Incorrect conclusions in this direction could be a source of mystification. In creating Automated Management Systems (AMS) in Czechoslovakia, one does not operate with amounts of information but amounts of data in the information processes and spiritual activity of man in general--planning, accounting, figures, etc., such as are included in official documents, memos, reports, tables, graphs, etc. But the amount of information is not equal to the quantity of tables, etc. This disagreement in the units used makes quantitative comparison of informational totals difficult.

The quantity of data gives us only an approximate idea of the quantity of information. This is because a given informational content may be expressed by quite different amounts of data. For example, in the table of days worked, if we substitute the data on absenteeism, the amount of data is sharply decreased but we have enough information for the calculation of salaries.

B. Typical Information Systems Used in Czechoslovakia and the Bases of Their Projection

Information systems can be varied, because, in creating them, one looks not only at the purpose of management but also at the particular management processes. Management in Czechoslovakia is realized by needs of the whole set of information systems, and it can be classified as follows: we could not talk about all types of information systems. I will use an example by width of scope we could divide the systems into complex, over which operate with large amounts of information, and local, over which operate with information dealing with simple tasks of management. Information systems of management should cover the informational needs of the whole complex hierarchy of management authorities. It was understood as follows:

(1) The information system is an organic part of the total system of management. The volume of information which has to be processed in a system of management grows as the economy gets more complex.

Many theoreticians have tried, under given conditions, to increase the maneuverability of centralized planning system for state enterprises. We tried to show the possibilities of applying the cybernetical connection to management. From this knowledge, we derive Exhibit 1 about the function of national economic system in condition directed management. (Exhibit 1 in Appendix.)

(2) The information system of management is a means of organizing informational management. So on demand we obtain timely input of needed information at all managerial levels. From the standpoint of space, we must localize all places from which we receive information,

where it is processed, where it is stored, and where it is sent. From the standpoint of time, we must define the localization of information as it is processed. From the standpoint of periodicity, every operation of processing of information and speed of transfer through communication channels has to have these parameters:

- amount of information according to information sets
- intensity of informational flows in the communicational network
- capacity of the transmission channels in management systems
- speed of data retrieval, data processing and transmitting managerial information
- breakdown of work with information in processing of management.

In this chart I would like to show you how informational ties of enterprises units functioned in a rigid hierarchical structure of management. For the lowest level of management it was considered that management of enterprises subsystems (i.e., plants). On this level are gathered the basic characteristics of technical economic information which originate in the process of manufacturing. The middle level was based on branch management, where information was partly aggregated. The informational relations pictured (show) objects which are similar according to manufacturing production, structures of material and manpower costs, exploitation of machinery equipment, etc.

By aggregation, on this level, great parts of information were basically lost about the economics of the plant. For that, even the negligible part of circulating information could be used for the harmonious activity of the enterprises of a branch. At the highest

level the management of the national economy was considered where it continued to aggregate information from bottom, whose main purpose was regulating the simplifying systems of branch management. This was the first task of the Department of State Planning. The gradual liquidation of this rigid system will be an unusually and an extremely hard problem. Meanwhile, for it is solution, there are no existing accepted methods. (Exhibit 2 in Appendix.)

(3) The information system of management is a special documentational-statistical system because their basic character of information is statistical in nature. The functional content of the informational system of management was based on these principles:

(a) Nomenclature of information. The information system of management contains only information which needs special preparation and is used with special designation. Information of general designation and incidental (secondary) information was not included in this structure. It was necessary to group all information according to their most important characteristics.

(b) The system of indicators: In the information system of management in Czechoslovakia there was a system of indicators for catching all quantitative characteristics which were needed for centralized management. The method of their calculations was uniform:

- efficiency of capital which is the share of production, expressed in crowns, of one crown of average yearly value of basic production funds.

- time of return of investment, which is the relationship of the investment to the increment of profit from this investment.
- material expenses (without amortization), per crown of goods produced.
- labor productivity, which is the volume of production of one unit of time worked.
- the relationship of rate of growth of labor productivity to the rate of growth of average salaries.

(c) Informational flow. In the hierarchical structure of leading organizations, the flow of information was secured only on the vertical line in both directions, downwards and upwards. So that the leadership could function as a whole, there were certain steps taken to gain information horizontally, i.e., among comparable functional units in the hierarchy.

Orders for how the state enterprises must build their computing centres were coming from the idea that there should be only one uniform gigantic information system in Czechoslovakia (one part of that structure--an example for one department can be seen in Exhibit 3). (Exhibit 3 in Appendix.)

For the circulation of documents in the system of management, the so-called documentational flow, it was necessary to create:

- guidelines for drafting documents, suggesting classifications and nomenclature, simplified terminology and common codes,
- simplified rules for modifying and adapting various documents,
- creating a scheme of document flow.

C. Management of National Economy in Czechoslovakia and its Informational Support

Since 1945 in Czechoslovakia, there have been made four changes in the laws concerning the building of informational systems for management of the national economy, in 1946, 1951, 1963, and 1970. Technological changes are not addressed by these laws. An all-State integrated information system started to be built in the seventies. It comprised three individual subsystems:

(1) A uniform subsystem of socioeconomic information (statistics, accountancy, calculation). This system was not able to create the conditions for the development of the national economy. The methodology of this subsystem was created by the Federal Department of Statistics and the Federal Department of finance, and it was binding for all organizations and companies. It was quite often criticized as cumbersome.

(2) A uniform subsystem of information for creating a macroeconomic plan (1 year, 5 years, and long range), is the informational guarantee of the cycle prognosis concept, and long range outlook. The long range outlook was the basis of the Federal Government's concept of long-term development. This system includes information which contains the so-called comprehensive plans, state budget and the budget of the regional committees. Methodological management is jointly guaranteed by the Federal Department of Planning and the Federal Department of Finance.

(3) A uniform system of scientific, technical and economical information which contains documentary and bibliographical information

about all branches of science. Its methodological management was guaranteed by the Federal Department for Technical and Scientific Development. Thus a uniform system of socioeconomic information comprises two basic fields of information:

(a) information which originates in companies (enterprises and plants) the so-called integrated informational system of organizations

(b) information which the supervisory institutions of enterprises receive from their subordinate enterprises and from persons beyond the sphere of the enterprises--this constitutes integrated national information system. An integrated informational system of organizations contains not only socioeconomic information but also scientific, technological, and economic information and cognitive information. Cognitive information usually represents the biggest part of the system. We can include in this system also information about technical norms and prices.

From the above described systems it is clear that centrally, directly, and methodologically managed information is not sufficient for any lower level of management. The individual enterprises were using only part of the informational resources of the informational system. Companies had to use other informational systems which in the understanding of the center were not clearly characterized. Besides these, there are great differences in the demand for information on different levels of management in Czechoslovakia.

1. Transformation of management power into relation of enterprises and company management.

2. It shows closed entirety of business relatively independent state enterprises in preparation to cross into market economy. (Exhibit 4 in Appendix.)

Business activity of state enterprises could in transitory period contribute to the speeding up of transition of national economy to new conditions. So I am trying to show you an example of the task of the present and of what it might be in the future. Therefore, the most important role should be played by new methods of economic decision making, computerization, and marketing. (Exhibit 5 in Appendix.)

This new situation must be able to assimilate, what in literature is understood as the industrial milieu:

(a) The physiological assimilation of man to industrial manufacturing,

(b) Socio-psychological factors including the relationship between technical and administrative functions.

Successful enterprises have to be developing, balancing and concentrating on their technical, social and strategical viewpoints. Management accountancy must be playing a decisive role.

In a market economy is this demand formulated as a marketing function plus as a strategic and long-term planning activity focused on assimilation of enterprise to changing surround milieu. (Exhibit 6 in Appendix.)

For a basis of management of enterprises and companies in the immediate future, it is necessary to find ways how to determine goals for their strategic decision making. Only in this way, we can increase security, in the politics of development broadest measure was coming from a total analysis of the strategic plans of enterprises--and not as it has been until today, wherein goals were not derived from exact and clear long-term prognoses of the national economy or of branch development. These new development politics are creating, for example, possibilities for the executing of competitive projects and personal projects alike. (Exhibit 7 in Appendix.)

A thorough analysis of goals and resources should be conducted to increase the efficiency of the system. It could be done by means of analysis of hierarchy of goals and funds of enterprises. The result of this analysis then should be projected to achieve higher internal efficiency and effectiveness (for example--socio-technical goals). I can explain recognition of goals of external influence for effectiveness (for example, some marketing projects). We must also recognize that other players in the market may have different goals and strategies. Our strategies and goals must therefore be developed considering these external players, their goals and their strategies. (Exhibit 8 in Appendix.)

How then, in the immediate future can enterprises rightly identify the problems and how they can determine the right causes of these problems? I see a solution in that they can escape from that model of the balancing of enterprise development, which contains three different fields of decision making: strategic, short term, and

operating margin. So if the results of this phase was not in agreement with determined goals we can define either deviation from those problems or we can find new problems with continued comparisons of the described process of occurrences (Exhibit 9). We can determine the field (space into which falls a solution of the problems: (1) programmed development, (2) planned development, and (3) introductory development. (Exhibit 9 in Appendix.)

In conclusion, the new relationships which enterprises have, to receive space in the immediate future, have to express those laws, of which stipulate optimal decision making by top management people both in enterprises (companies) and in the conditioning of a market economy. A way to that was made by the devaluation of the Czechoslovak koruna to the US $ (18%), and the revaluation of the koruna to the Soviet rubel. Toward this goal it is also necessary to subordinate the pedagogical process necessary for the education of new experts--managers on a threshold of a new century. (Exhibit 10 in Appendix.)

Conclusions. Just as central organs needed mainly global information and political information, so also enterprises and plants needed concrete information about products, technologies, working environment, etc.

D. From the Previous Chapter There is a Need to Add a Few Notes About the Content of Auditing

For example, internal auditing is understood as a multicompetent activity comprising:

- subfunctions (management, agenda, operations) with the help of these some were trying to realize their individual goals.

Internal auditing was divided into these separate activities:

- obtaining information about progress in fulfilling plans
- comparing reality with the goals of plan (of norms, needed parameters and needed progress of process)
- determining the deviation from the stated goals (given parameters, norms)
- analysis and determination of causes of the deviation
- accepting decisions about the manner of removal of deviation and measures needed for their removal (acceptance of correctional decisions)
- giving orders for removal of deviations (influence on controlled objects)
- operational guidelines for overcoming the deviations and verifying their realization
- to give proposals for a change of plans

From the above-mentioned survey it is evident that auditing is realized first of all with the help of information activity, analysis, decisions, direct influence and organization.

For clarity we show a chart from which it is clear that the content and the running of an audit is the function of management. (Exhibit 11 in Appendix.)

Auditing information (which is acquired through internal sources of organizations, operating accounts, and operating reports), must be acquired by auditors themselves directly on the premises.

Automatization of informational processes should contribute to substantial time saving between origin and transmissions of individual information to pertinent auditing officials.

Auditing system was the obligatory norm, containing a collection of regulations for realizing the auditing activities of organizations. An auditing system contains these elements:

- designation of objects on which auditing should be done, designation of object and a way of its realization,
- designation of auditing places in an organization (subject of auditing, auditing place is understood to be a unit or clerk who is audited),
- informational responsibility of the unit being audited (enterprise, company),
- way of obtaining, processing and transmitting auditing information to individual auditing places,
- jurisdiction of auditing places to accept correct conclusions, make regulatory interventions in the progress of the activity, giving pertinent orders and realization of necessary measures,
- designation of the unit and workers responsible for creating the internal auditing system.

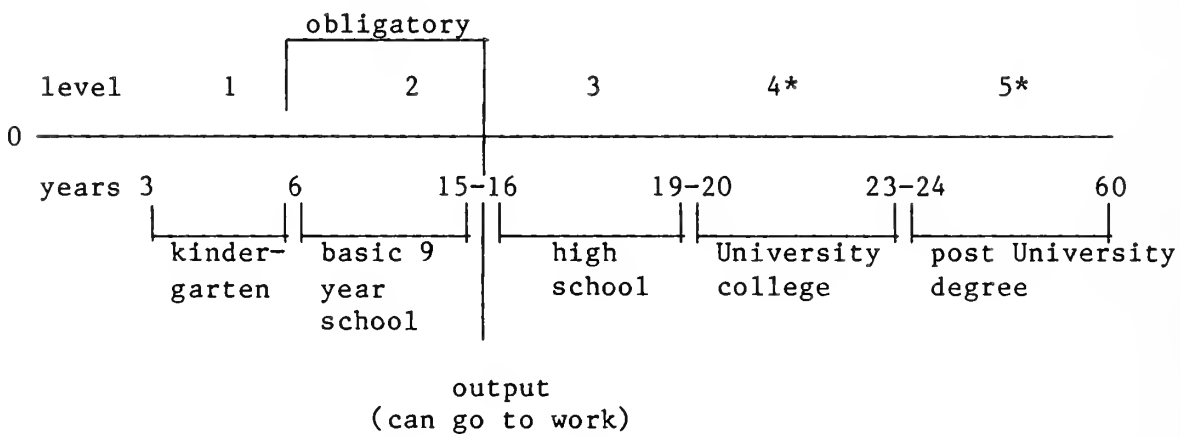
II. Current Educational Preparation within the College of Management of the University of Economics at Bratislava

A. A Short History of the University and a Few Notes About System of Education in Czechoslovakia

The University of Economics in Bratislava in Czechoslovakia started in 1940 as a private university. Until 1945, when it was

nationalized, only 158 students graduated. There are now about 5,000 full-time students in all colleges of the University, and about 2,000 part-time students. Full-time freshman students number about 1,200, 500 part-time, and about 100 come from 31 countries and four continents. To date, 300 foreign students have graduated. The pedagogical program which has been in effect since 1986/1987, approved by the Department (ministry) of schools, is done in cooperation with the University of Economics in Prague and the University of Economics in Bratislava.

In Czechoslovakia the system of education is as follows:



4* - University degree: engineer (Ing.), medicine, law doctors (MUDr, JUDr), doctor of philosophy (Ph.Dr.) (like "minor doctorate")

5* - post University degree (not obligatory - can somebody take during his/her whole live years):
1st level - Ph.D. (master of science)
2nd level - Doctor of Science (like "major doctorate")
3rd level - Academician (member of Academy of Science)

B. Graduate Study

Education of graduates in the University of Economics is based on theoretical preparedness enabling him/her easier adaptability and

application in employment. Uniform and broad basic studies are common for all departments in the University of Economics. On this basis courses provide a field of concentration in which students earn deep knowledge in economics and managing a branch of national economy, or other economic activity.

Today the University of Economics in Bratislava has 5 Colleges and 17 fields of academic specialization. These are as follows:

(1) College of National Economics

- Political Economy
- National Planning
- Finance
- Economics of Investment and Scientific & Technical Development
- Teacher Education

(2) College of Commerce

- Economics of Retail Commerce
- Economics of Foreign Trade

(3) College of Management

- Accountancy (ACC)
- System Engineering (SE)
- Economic Statistics (ES)
- Mathematical Methods in Economics (MME)
- Automated Management Systems (AMS)

(4) College of Economics and Management of Production in Branches:

- Economics of Industry
- Economics of Agriculture
- Economics of Work

(5) College of Tourism and Services (outside of Bratislava, in B.Bystrica):

- Economics of Tourism and Services
- Economics of Non-Manufacturing Sectors (health, education, ...)

To explain the whole process of education I will use the example of the College of Management and how the academic specialization comes about.

1. College of Management - Preparation Faces of Academic Specializations:

(a) Accountancy: graduate needs to study accounting methodology, including organization methodology and technology of economic information and control and auditing. Using computer programming, graduate needs to process and use economic information in all levels of state management: enterprise; companies; and governmental departments. The students have a knowledge of accounting, cost control and calculation, analysis of economics and control, revision and automatization of information system in enterprise.

(b) System engineering: graduate needs to study management systems, modeling and planning, economy management systems, organization and management production, cybernetics and

system theory, information processing, decision-making, stimulation processes, controlling processes, etc. Students learn how to formulate and improve organizational relationships in management systems and how to solve problems of integrated technical operations and production, economic and social functions in management systems of state enterprise.

(c) Economic statistics: graduates need to study statistical theory, social-economic statistics, theory of optimal verification, branch statistics and demographical statistics based on a deep knowledge of math, theory of probability and methods of mathematical statistics using computer technology. The curriculum is very demanding on the broad mathematical knowledge of the students who are gaining not only deep theoretical and methodological knowledge from the field of statistics but also practical knowledge and the ability to process information with computer programming.

(d) Mathematical method in economics: graduate students need to study the following areas: problems of quantitative analysis of economic processes; information systems; formulation of economic tasks and application of methods and technique of mathematical models; use of computer technology taught in subject like linear and dynamic programming; structural analysis; econometrics; operational analysis; stochastic models; and automatization of computation.

(e) Automated management systems: graduate needs to study system analysis and management systems planning with computer technology.

2. Number of Required Courses for Individual Academic Specialization (Curriculum)--For Example, Accountancy (Table 1)

2. Number of Hours of Accounting versus Other Courses for Individual Academic Specialization

(a) It is not possible in this seminar to explain in detail everything in all connection the curriculum. I will zero in on the relationship between the amount of hours assigned to accounting and to other courses (subject), which students are required to take. We can see how the curriculum was constructed regarding the theoretical frame used in Czechoslovakia, however, you need to know on what principles the curriculum is based:

(1) Assumption was that there are 30 hours weekly which the students have to spend in school.

(2) Every semester (fall and spring) has 15 weeks lecturing time. In four years of study there are eight semesters, which is 3,600 hours.

(3) To that we have to add hours of military preparedness services which are mandatory for all males and civil defense for all females, physical education (male and female), and other elective courses which amounts to 950 hours.

(4) Conclusion. During the study, University of Economics students spend 4,500 hours in school.

(b) In this example using the accounting curriculum we see this total composition of hours:

	hours	%
A. Political courses (studies) - all together	720	h/16%
B., C. Basic theoretical courses and courses of theoretical application	1290	h/28%
D., E. Basic specialization courses and languages	1590	h/34%
F. Supplemental courses	950	h/22%
Total	4550	h/100%

For future reconstruction of curriculum there is a need to find timetable to change old courses for new. From the above figures we see where we can find reserves in political studies courses and military preparation courses. One more interesting view we get with analysis of curriculum of individual fields of specialization are the hours dedicated to subjects close to economic reality in the market economy: statistics, accounting, finance, cost management, general costs, etc.

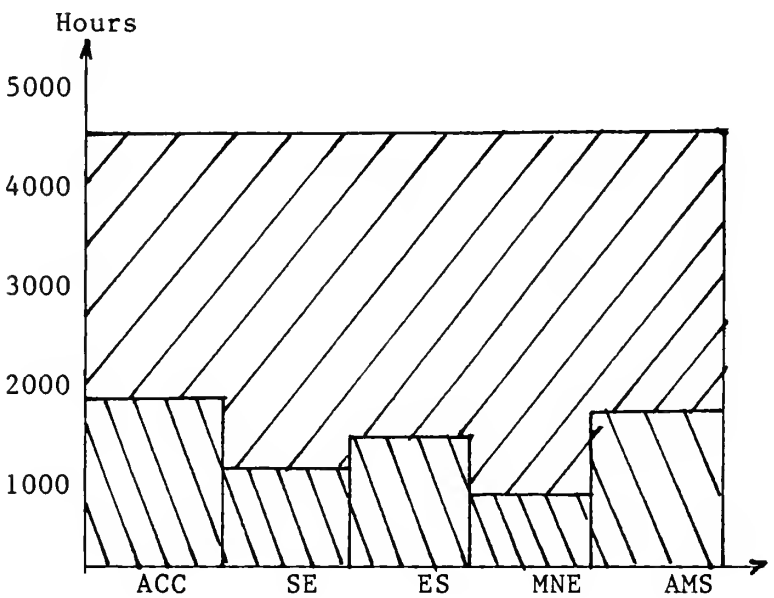
In individual fields of specialization (FS) if we take into consideration only the groups of courses B, C, and D, it looks this way:

Exhibit 12

FS	ACC		SE		ES		MME		AMS	
Group of Courses*	B&C	D	B&C	D	B&C	D	B&C	D	B&C	D
No. of Hours	720	940	630	360	570	720	570	0	630	600
Together (Chart 3)	1670		990		1290		570		1230	
% to whole	36.7%		21.7%		28.3%		12.5%		27.0%	

*Group of courses B&C and D are not everywhere equal.

Exhibit 13



From the previous charts (graphic and numerical) we see that we need:

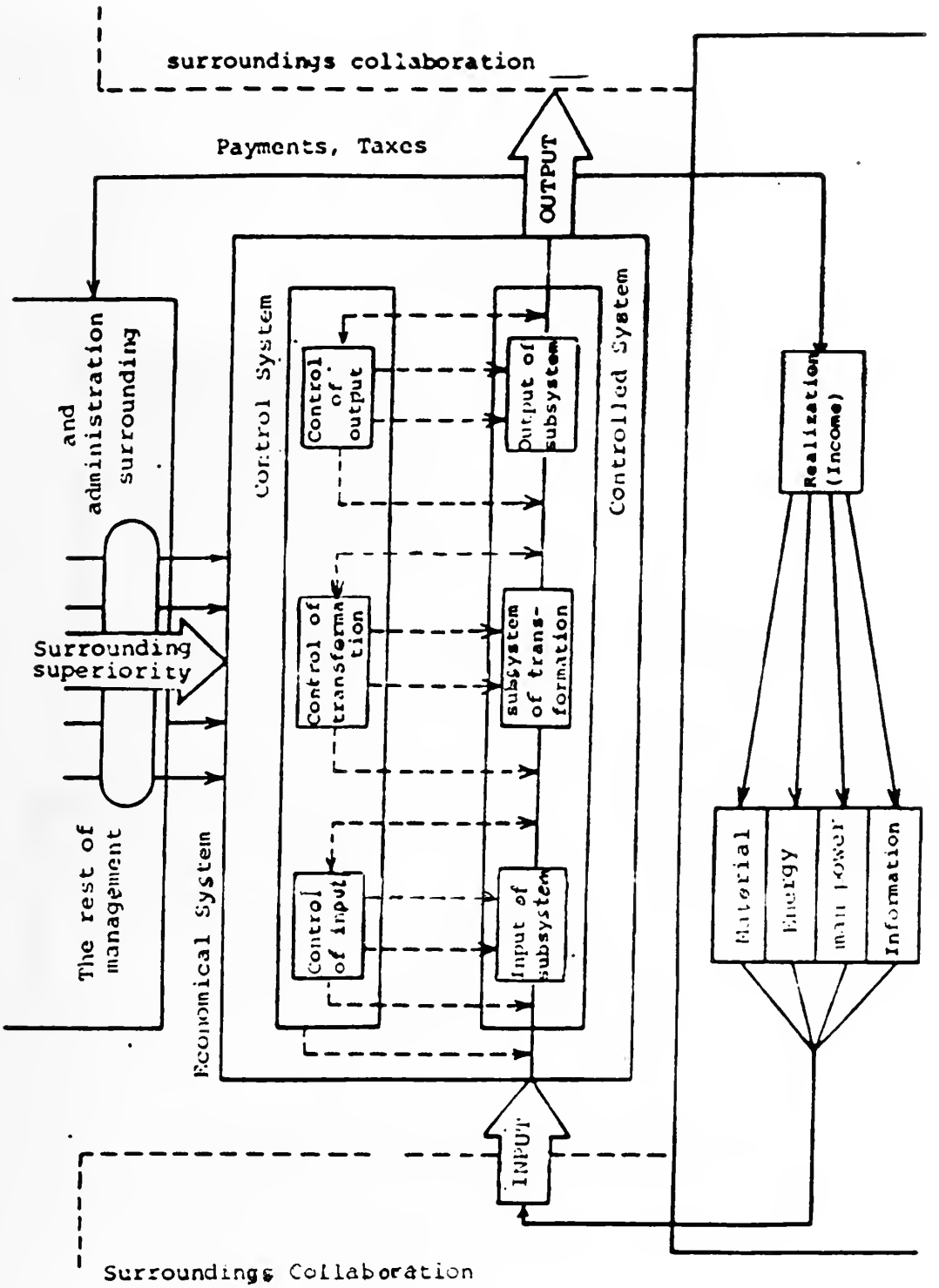
(a) to shorten the time for military training of graduate students (male) and civil training (female),

(b) to lower the number of fields of study by homogenizing their educational content into central courses (e.g., accountancy, finance, management),

(c) to revalue the other courses in order to remove duplication in them,

(d) to try to implement, at least partially, the American system of graduate study--i.e., to give students free selection of offered courses. (This variation could be used if there would be established an American system of undergraduate and graduate study in every university in Czechoslovakia.)

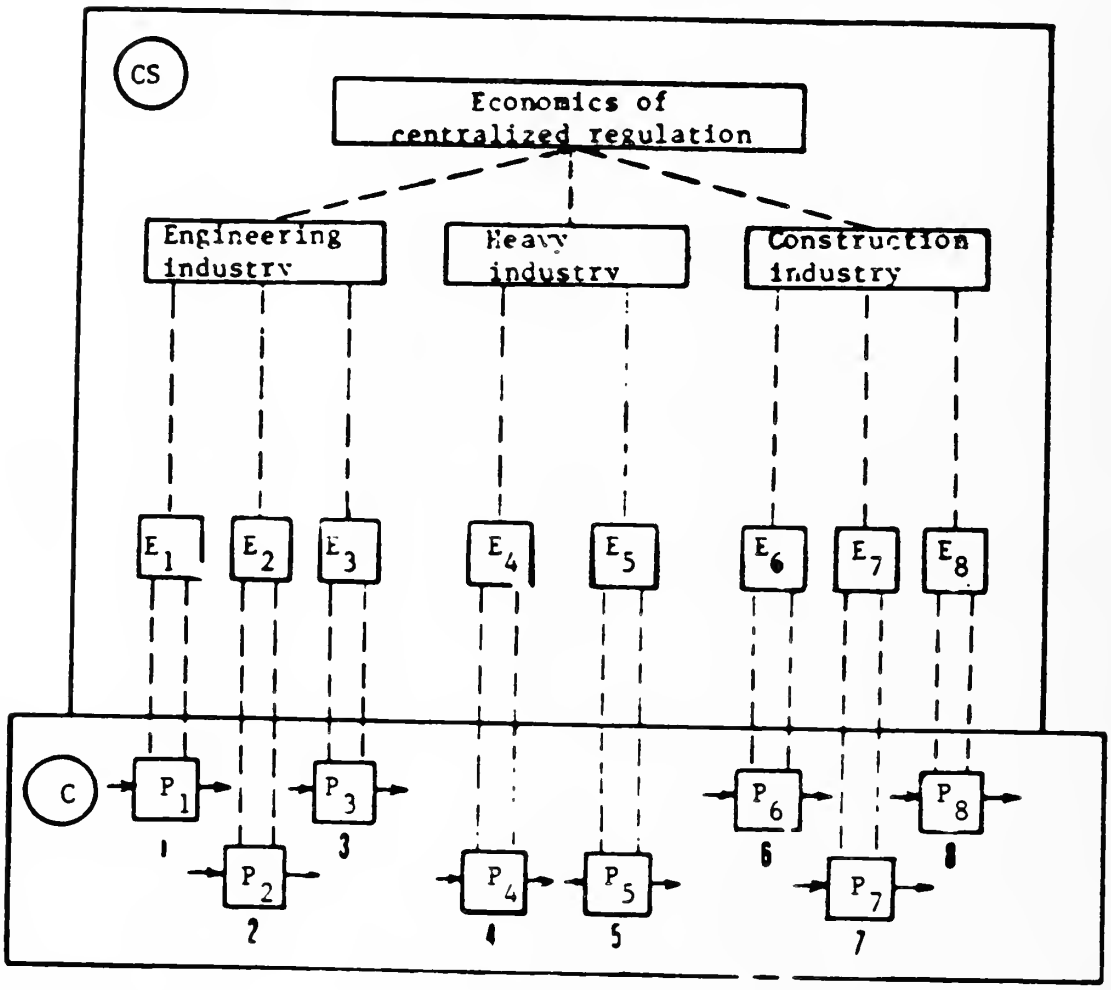
A P P E N D I X



Scheme of function of Economic Systems

Exhibit 2

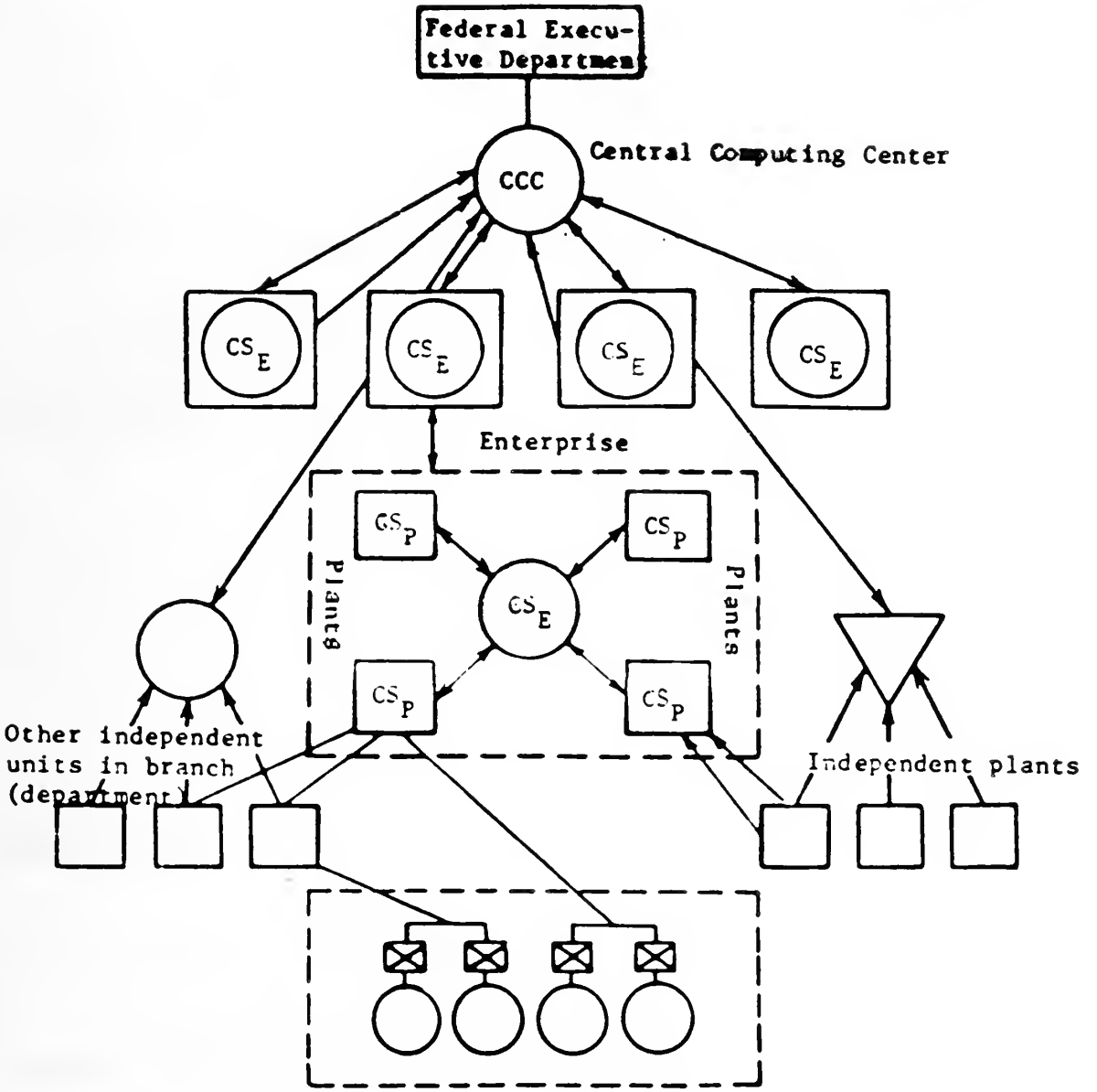
The flow of information in hierarchical structure of management of individual subsystems (subjects) from the branch viewpoint.



Legend:

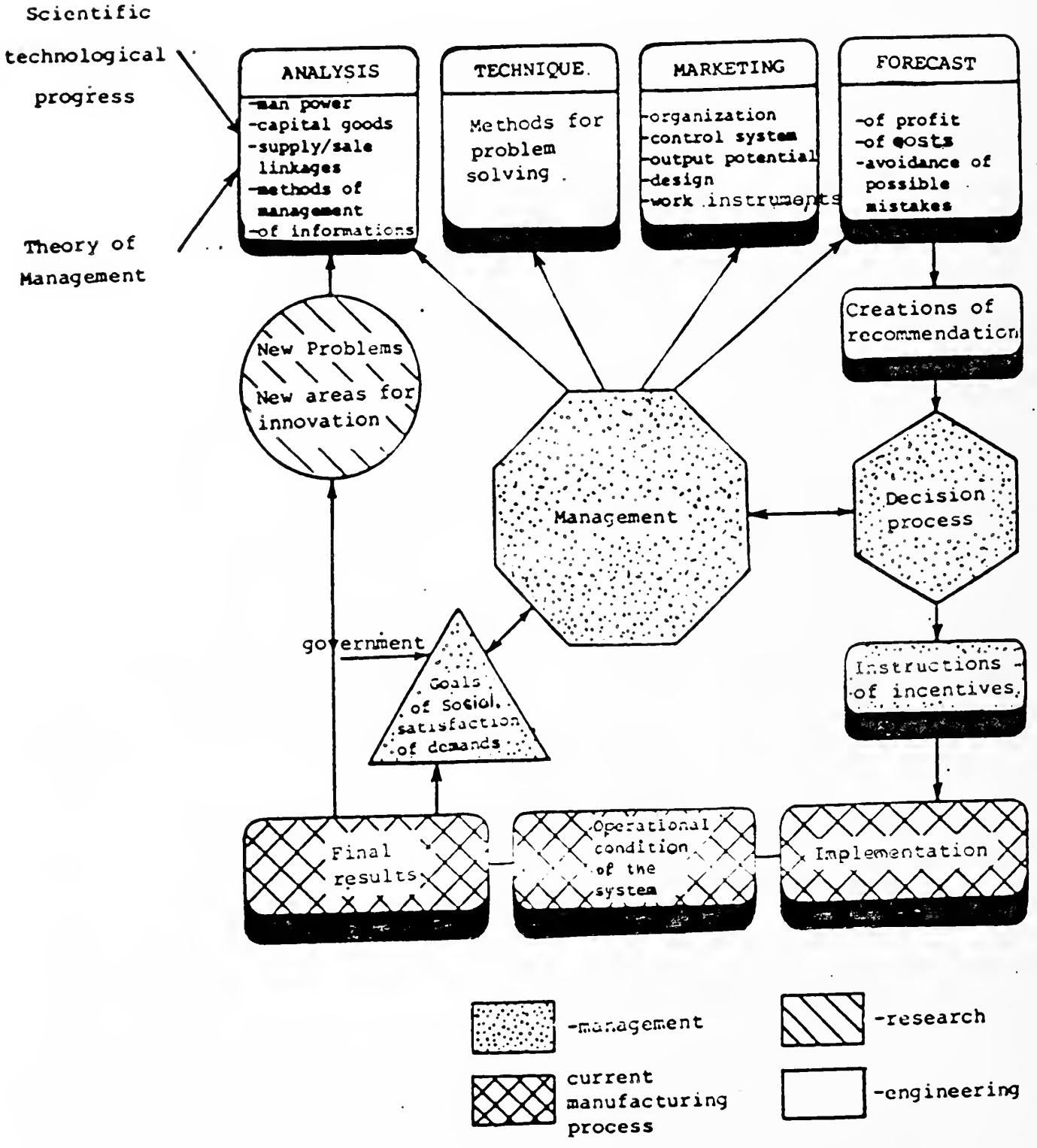
E - enterprise
P - plant
CS - control system (superior fields or units of management)
C - controlled system (object of management or control) - units of submission

Exhibit 3



CCC - Central computing center
CS - Computing station of enterprise

Transformation of management power into relation of enterprises and company management

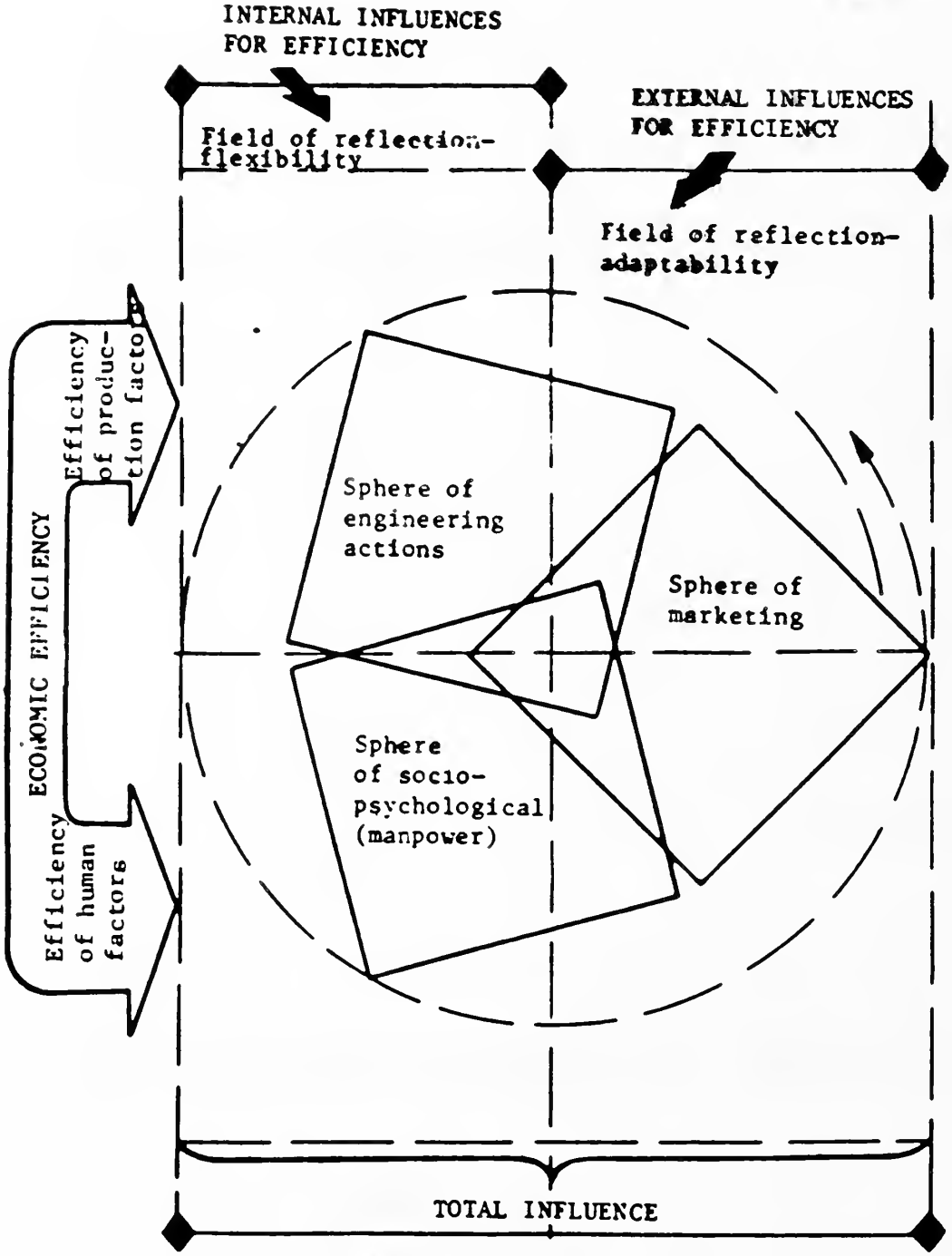


It shows closed entirety of business relativly independent state enterprises in preparation to cross into market economy

Exhibit 5

SITUATION OPTION
Simultaneous appreciation of costs and profit, production, market, financial and other non-economical conditions.
PRESENT
FUTURE
Finance and organization of enterprises
Reviewing
Decision
Feedback Control
FIELD OF STIMULATION OF ENTERPRISES
Tasks from government and organization of enterprise
Output relation and Internal components
Definitions of problems
-targets analysis
-election of criterions for targets achieving
-marketing
Models
-observation
-experiment
-data assembling
Problem solving
-simulation
-economical mathem analyses
-logic and realism
-nonmaterial investments
Reviewing
Decision
Feedback Control
*-Accounting
-Budget
-Price politics
-Work studies

Exhibit 6



Projections of improvement of reaction of enterprise on the internal and the external influences

Exhibit 7

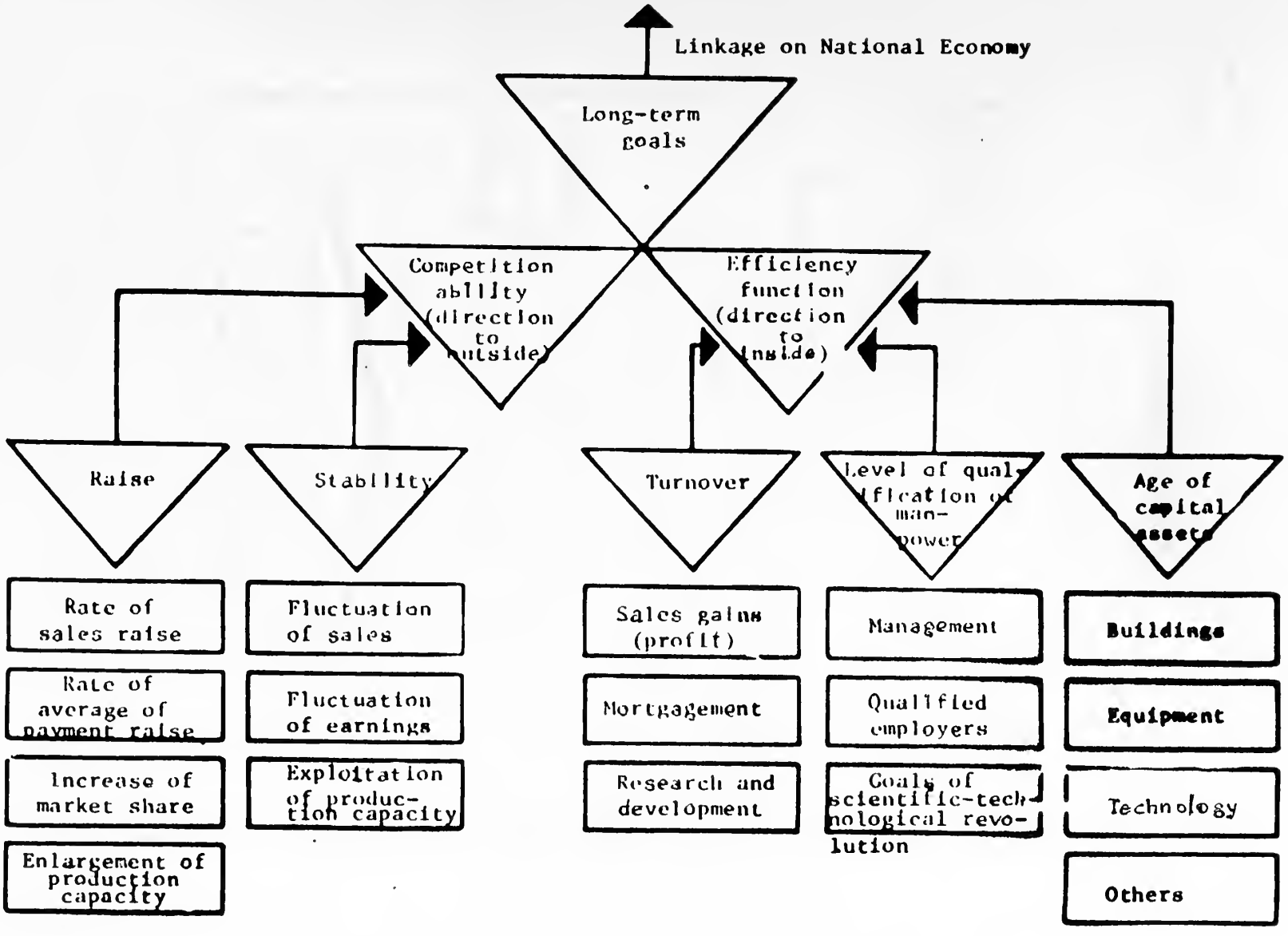

Linkage on National Economy
Long-term goals
Competition ability (direction to outside)
Efficiency function (direction to inside)
Raise
Stability
Turnover
Level of qualification of man-power
Age of capital assets
Rate of sales raise
Rate of average of payment raise
Increase of market share
Enlargement of production capacity
Fluctuation of sales
Fluctuation of earnings
Exploitation of production capacity
Sales gains (profit)
Mortgagement
Research and development
Management
Qualified employers
Goals of scientific-technological revolution
Buildings
Equipment
Technology
Others

Exhibit 8

Linkage of Market Knowledge and Realization of Enterprise Targets

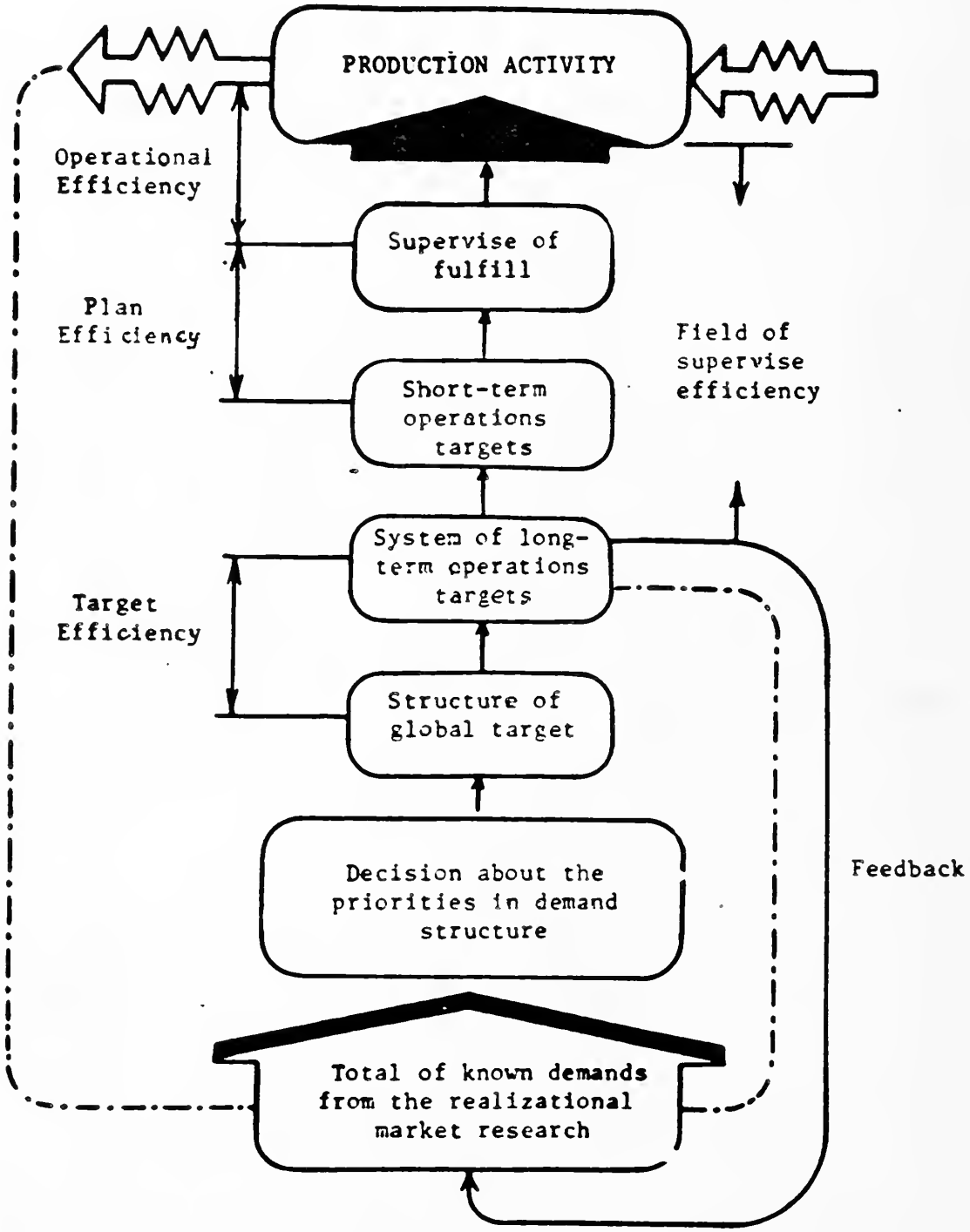
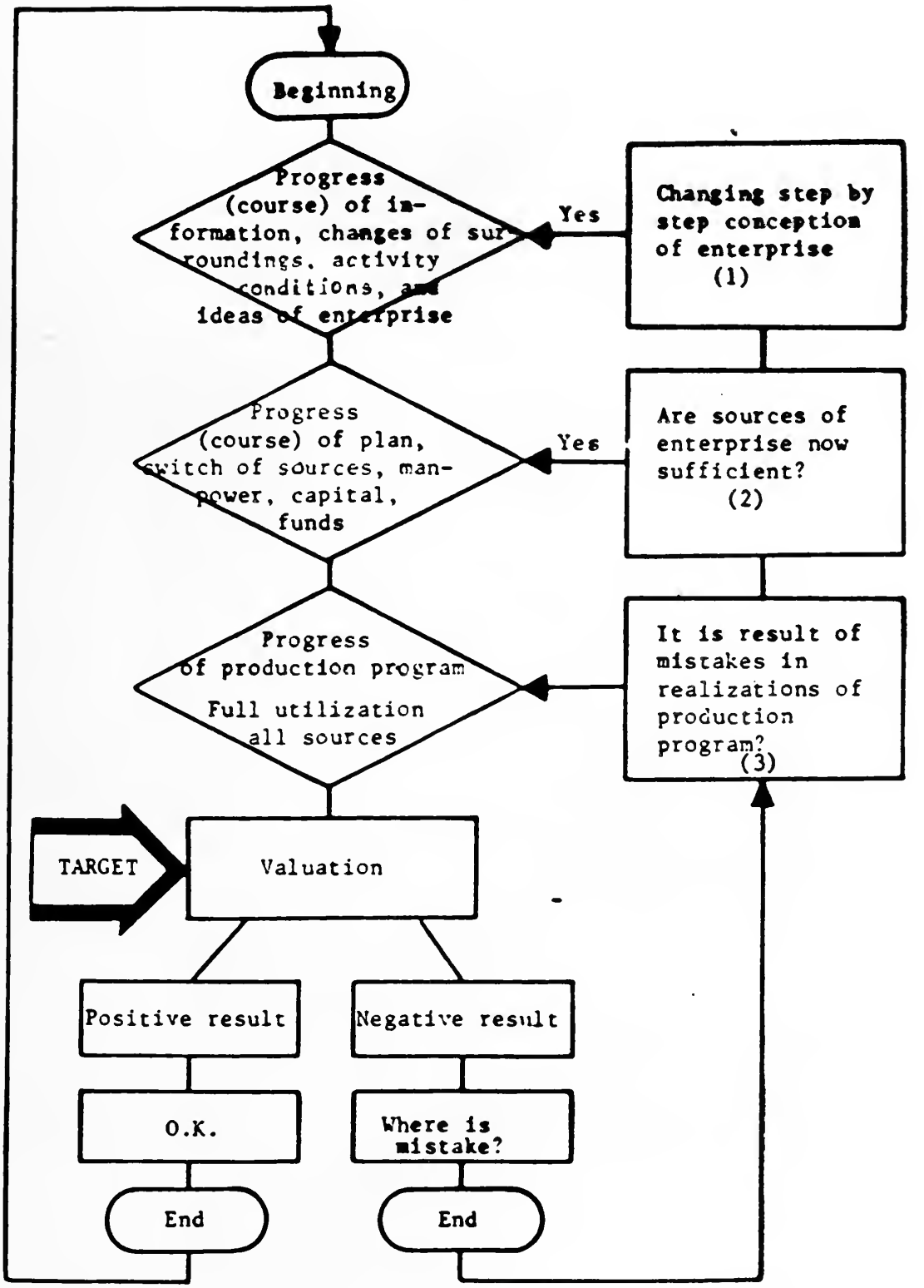


Exhibit 9



System Conception of Influence of Activity of Enterprise in New Conditions in Czechoslovakia

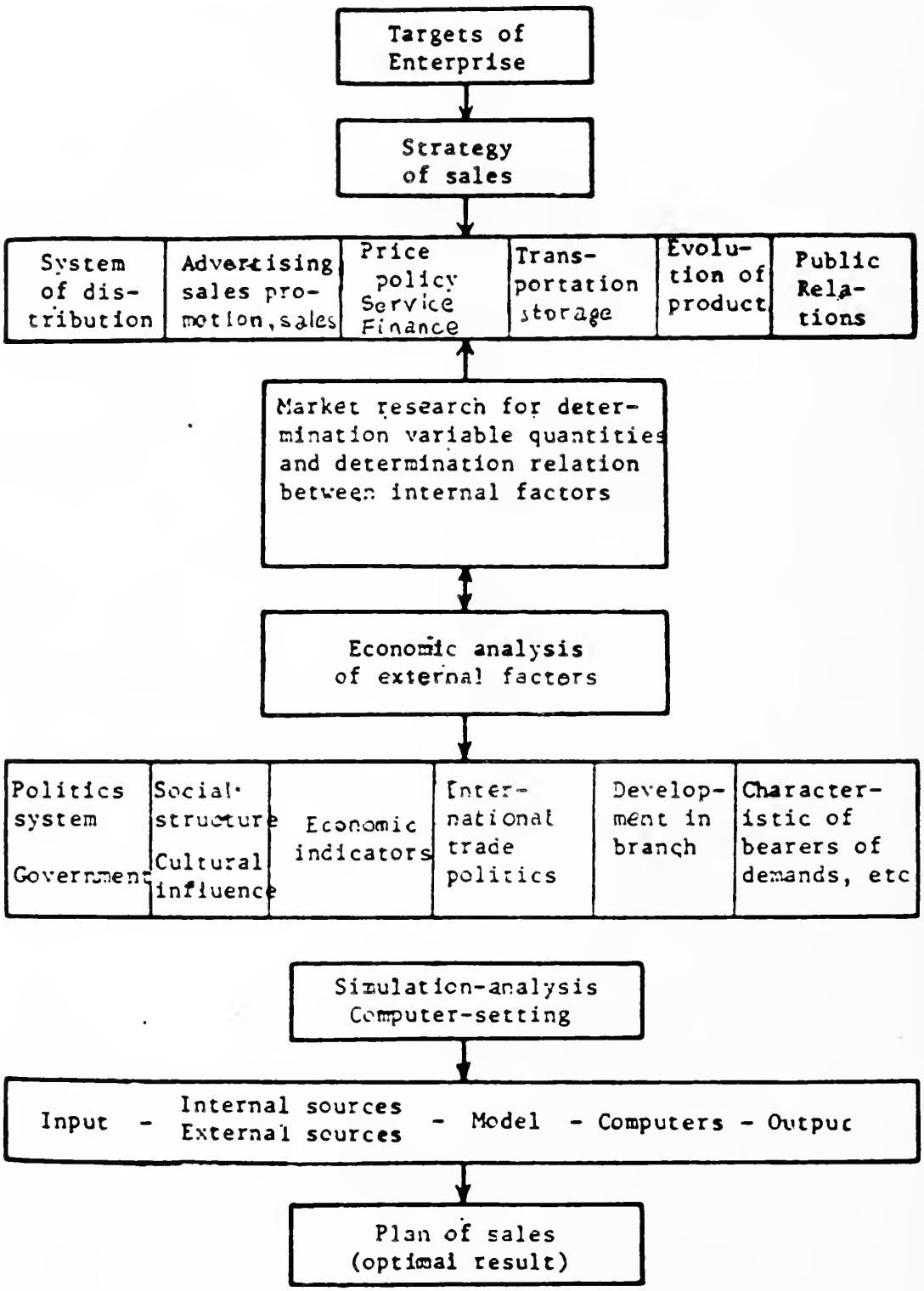
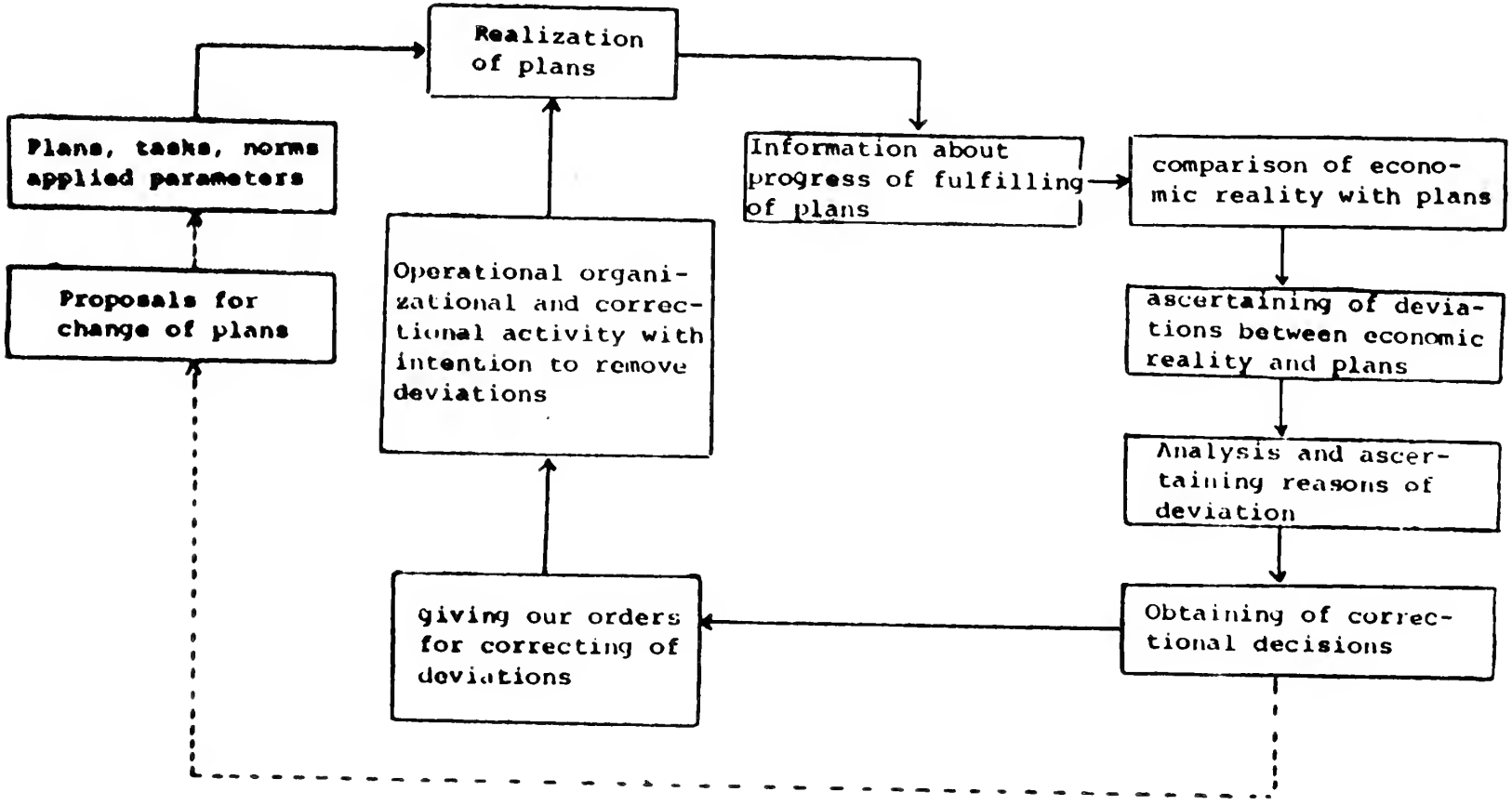

Targets of Enterprise
Strategy of sales
System of distribution
Advertising sales promotion, sales
Price policy Service Finance
Transportation storage
Evolution of product
Public Relations
Market research for determination variable quantities and determination relation between internal factors
Economic analysis of external factors
Politics system
Government
Social structure
Cultural influence
Economic indicators
International trade politics
Development in branch
Characteristic of bearers of demands, etc
Simulation-analysis Computer-setting
Input - Internal sources External sources - Model - Computers - Output
Plan of sales (optimal result)

Exhibit 11



Scheme of auditing process

FULL TIME STUDY

B. ACCOUNTING
(timetable week hours per courses)

TABLE I

No. Courses	Year	I		II		III		IV		Total Class Hours (15wks.x wk.hr	
	Semester	1st	2nd	3rd	4th	5th	6th	7th	8th		
	I. REQUIREMENTS (prescribed courses)										
	(A) Political courses	3/4*	3/4	2/2	2/2	4/2	2/2	2/2	4/8	720	
1-5.	Political economy, philosophy, etc.										
	(B) Basic theoretical courses										
6.	Mathematics	4/2zs**	4/2zs	-----	-----	-----	-----	-----	-----	180	
7.	Theory of statistics	-----	-----	2/2z-	2/2z-	-----	-----	-----	-----	120	
8.	Optimal programming	-----	-----	2/2zs	-----	-----	-----	-----	-----	60	
9.	Accounting I	-----	2/3z-	2/4zs	-----	-----	-----	-----	-----	160	
10.	Basic data processing	2/2zs	-/2z-	-----	-----	-----	-----	-----	-----	90	
11.	Law	4/--s	-----	-----	-----	-----	-----	-----	-----	60	
12.	Economical psychology and sociology	2/1zs	-----	-----	-----	-----	-----	-----	-----	50	
13.	Theory of management	-----	-----	2/--s	-----	-----	-----	-----	-----	30	
14.	National planning	-----	-----	-----	2/2zs	-----	-----	-----	-----	60	B + C = 1290
15.	Finance	-----	-----	2/2zs	-----	-----	-----	-----	-----	60	
16.	World economy	-----	-----	-----	-----	-----	2/--s	-----	-----	30	
	(C) Courses of theoretical application										
17.	Economy of industrial enterprise	-----	-----	2/2zs	-----	-----	-----	-----	-----	60	
18.	Finance of enterprise	-----	-----	-----	2/2zs	-----	-----	-----	-----	60	
19.	Economic statistics	-----	-----	-----	-----	2/2zs	-----	-----	-----	60	
20.	Computer lab	-----	-/2z-	-----	-----	-----	-----	-----	-----	30	
21.	Automated management systems	-----	-----	-----	2/2-s	2/2zs	-----	-----	-----	120	
22.	Operation research	-----	-----	-----	-----	-----	2/2zs	-----	-----	60	
	(D) Basic specialization course										
23.	Control of cost and calculation	-----	-----	-----	4/2-s	2/4zs	2/2zs	-----	-----	240	
24.	Accounting of branch	-----	-----	-----	-----	4/4zs	-----	-----	-----	120	
25.	Economy analysis	-----	-----	-----	-----	-----	2/2-s	2/2zs	-----	120	
26.	Control and revision	-----	-----	-----	-----	-----	4/--s	2/2zs	-----	120	
27.	Accounting II	-----	-----	-----	-----	-----	-----	2/2zs	-----	60	
28.	Seminar	-----	-----	-----	-----	-/2z-	-/2z-	-/2z-	-/2z-	120	
29.	Thesis seminar	-----	-----	-----	-----	-----	-/2z-	-/2z-	-/2z-	90	
30.	Seminar to final exam	-----	-----	-----	-----	-----	-----	-/2z-	-/4z-	90	
31.	Basic accounting	2/2zs	-----	-----	-----	-----	-----	-----	-----	60	D + E = 1560
32.	Accounting theory	-----	4/-s	-----	-----	-----	-----	-----	-----	40	
33.	Computer information systems of enterprise	-----	-----	-----	-----	-----	2/2z-	2/2zs	-----	120	
34.	Analysis of accounting report	-----	-----	-----	-----	-----	-----	-----	2/2zs	60	
35.	Mechanism of national economy	-----	-----	-----	-----	-----	-----	-----	2/--s	30	
36.	Decision making	-----	-----	-----	-----	-----	-----	2/2zs	-----	60	
37.	Electives courses	-----	-----	-----	-----	-----	-----	-----	-/1-s	20	
	(E) Languages										
38.	Russian	-/2-s	-/4zs	-----	-----	-----	-----	-----	-----	90	
39.	Second foreign language	-----	-----	-/2z-	-/4zs	-----	-----	-----	-----	90	
	(F) Supplement Courses										
40.	Civil defense training (female)	-----	-----	2/1	-----	-----	-----	-----	-----		
41.	Military service training (male)	-----	-----	-/8	-/8	-/8	-/8	-----	-----		F = 950
42.	Physical education	-/2	-/2	-/2	-/2	-/2	-/2	-----	-----		
43-44.	Misc. Elective courses	-/2	-/2	-/4	-/4	-/6	-/6	-----	-----		

* Lectures/Seminars

** z = Assumption for exam
s = Exam

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