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ORGANIZATION FOR FORECASTING AND PLANNING

Experience in the Soviet Union and the United States

Edited by
W.R. DILL
G.Kh. POPOV

International Institute for
Applied Systems Analysis

Organization for Forecasting and Planning:

Experience in the Soviet Union and the United States

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Foreword

The need for more effective planning and management on the global, national, and enterprise levels is becoming more evident as societies and economies become more complex and interdependent. Scientific study and discussion related to the improvement of planning and management has received increasing support in the recent past in many countries, notably in the Soviet Union and in the United States. Until very recently, however, there has been little systematic communication on these subjects between American and Soviet scholars and practitioners, and opportunities for exchange of information and to learn from each other's experiences were very limited.

The system of economic management and control in the two countries is the product of different social systems. Planning in the USSR is organized and led centrally on a national level and includes all levels of territorial and economic administration in the Soviet Union. On the other hand, planning in the United States is not highly developed as a national governmental activity but is encouraged instead as a task for individual corporations or local governments. National integration of corporate and state and local government plans occurs through the working of the marketplace and the American political system. The federal government's management of the economy tends to be carried out primarily through fiscal and monetary policies, not through direct planning mechanisms.

It is impossible, of course, to apply mechanically one country's planning system, or even major elements of it, to the social system of another country. Nevertheless, acquaintance with the problems and practices of planning and forecasting in both the Soviet Union and the United States provides a rich basis for thinking about the fundamental economic and social problems that these practices are designed to address, and about how these practices might be improved.

This book, prepared by a joint Soviet–American editorial board, is an effort by planning and management experts from both countries to describe their views of

current planning and forecasting theory, practice, and problems. These authors analyze the patterns of development of planning and forecasting systems in each country and identify needs for and lines of further development. They identify planning and forecasting problems and practices common to both countries, and areas where joint research between the two countries might lead to greater effectiveness in the planning practices of each.

The book is the product of a dialogue between American and Soviet scholars and practitioners in the field of economic management. The foundation of the book was laid in two seminars, one held in Sochi (USSR) and organized by the Faculty of Economics of Moscow State University, and the other held in Mohonk, New York, and organized by the Faculty of Business Administration at New York University.

Presenting papers and participating in the discussions at these seminars were, from both sides, not only university professors of economics and management but also managers and professionals with active planning responsibilities at various levels in industry and government. To assure continuity, the main delegations to both conferences were the same. The week of formal discussions in each seminar was followed by another week of field visits to a variety of industrial and governmental organizations in Moscow, New York, and Washington, D.C.

These two seminars were the last in a series of five supported by the Ford Foundation (USA) and the State Committee for Science and Technology (USSR). The first seminar (Turin, 1970) brought twelve professors and practitioners from each country together to discuss the use of computers in management and planning. The second (Kiev, 1972) brought a similar group together to compare approaches to organizational design. The third (New York and Boston, 1973) brought Soviet experts to discuss management education in various countries with the faculties and business associates of New York University, Harvard University, and the Massachusetts Institute of Technology.

The Turin conference was a first of its kind, and as a first, it was overly formal and sometimes hindered by inexperience on both sides in communicating with the other across barriers of language and differences in general conceptions. Nevertheless, it ended as a success, with some of those attending agreeing to take responsibility for organizing and leading the later conferences.

We have watched with great satisfaction the growth of understanding, cooperation and personal friendship among the continuing participants in each new organizing committee meeting and in each successive seminar. Each new seminar tackled a more complicated and sometimes more sensitive agenda, and looked for higher standards in the preparation of discussion papers. The decision to volunteer the extra joint effort necessary to edit the results of the final two seminars for a book was a spontaneous result of the spirit that this series of seminars has generated among those who have taken part.

We hope that the cooperation sponsored by the State Committee for Science and Technology and the Ford Foundation will be useful and educational. Also, we hope the appearance of this book will encourage others to take part in similar

undertakings, and to overcome, as did those who participated in these, the unavoidable difficulties in collaborating on social science topics and problems across national boundaries encompassing significantly different social systems.

Since the seminars were originally planned, our respective countries have initiated other programs of interchange including large-scale programs of multinational research on complex management problems – notably work by the International Institute for Applied Systems Analysis in Laxenburg, Austria. We hope this book will reinforce these developments of interchange in the field of economic and social planning and forecasting by suggesting new areas for fruitful collaboration in research, teaching, and professional and managerial practice.

McGEORGE BUNDY
President, The
Ford Foundation

JERMEN GVISHIANI
Member, USSR Academy of
Sciences and
Deputy Chairman, USSR
State Committee for Science
and Technology

Preface

The program that brought Soviet and American delegations together in 1974 and 1975 for a home-and-home exchange of seminars and field visits on planning for economic enterprises had an educational intent. The goal was to get academicians, consultants, and practicing managers and planners from each side to explain the role of planning in the management of its economy and in the pursuit of social welfare for the society as a whole. What kinds of planning are done, and for what purposes? Where in the economy does it take place, and who participates? How is planning accomplished, and how is it then integrated both with the processes that determine broad social and economic goals and with the operating management decisions and actions that determine whether plans can be realized? In an art and science that is still under development, what new forms of orgainization for planning, what new techniques are being tried? What problems of improving the planning process are being addressed? Each side took these questions and tried to answer them for the other.

The discussions that followed – not only during the formal sessions, but after hours on a more informal basis – gave both sides the opportunity to broaden their understanding by asking questions and exchanging accounts of specific experiences. Even though the two delegations met against a background of experience and commitment in two *very* different economic and social systems, we came together because we each believed it was important to understand those differences. We also wanted to explore many areas of common practice and common concern. We hoped, and we have since realized, that there are some areas where further exchange and joint research could be of benefit to us both.

It is in that spirit of educational interchange that we decided to continue our collaboration beyond the two seminars to undertake this book. Of course we have not yet gained enough knowledge to convert the explanatory presentations and the question-and-answer sessions of the seminars into a comparative study of the two

systems of planning. But we did feel that we had come to know each other well enough to edit from the conference papers and discussions an explanatory presentation for a wider audience. The side-by-side overview of economic and social planning in the United States and the Soviet Union that this book contains will, it is hoped, share more widely the information and insights that the seminars gave to those who attended. Although the original seminar papers were of high quality, we have edited and changed them substantially to bring some of them up to date and to give coherence and clarity to the book. For you, the reader, as much as for us who participated in the seminars, we hope the presentations will suggest questions and avenues for further study, particularly relevant to your interests and experience.

The seminars and the book talk of economic and social planning, programming, and forecasting. However, the emphasis – by agreement – was more on economic planning and forecasting of the kind that ultimately influences the operations of units that produce and distribute goods and services in the two societies: i.e., the ministries, production amalgamations, and enterprises in the Soviet Union and corporations in the United States. We have looked at planning from the national to the local level and have discussed links between planning for economic performance and planning to meet other kinds of societal goals.

ACKNOWLEDGMENTS

This book represents the collective efforts of many people. We wish first to thank Professor Jermen Gvishiani and Mr. McGeorge Bundy, who first conceived the cooperative effort that has resulted in this book. In addition, in the 6 years since the first Soviet-American meeting was held, they have continued to provide moral, organizational, and financial support to the program.

We are also indebted to the authors and to the members of the joint editorial board. We would especially like to express our gratitude to Professors Gevork Egiazarian and William Guth, whose contributions to the preparation of this volume were invaluable.

The success of the seminars and of postseminar discussions was in large measure due to the skill of Elena Vyshinskaya and Galina Kotii, our interpreters, and we thank them for their help. Considerable assistance was also given to us by members of the Faculty of Economics at Moscow State University and of the Faculty of Business Administration at New York University, among them Vera Popova, Irina Barybina, and Gail Webber.

Finally, we must acknowledge the major role played by the International Institute for Applied Systems Analysis, which not only provided the site of postseminar discussions but also offered us the opportunity of publishing the finished work in its newly born International Series on Applied Systems Analysis. In particular, we thank Professor Edward S. Quade, whose contributions went far beyond his duties

as Executive Editor of IIASA's Survey Project. We also thank Dr. Alexander Iastrebov and Ms. Jeannette Lindsay, who helped resolve many of the conceptual and language problems that arose in the text.

W. R. DILL
G. Kh. POPOV

Contents

Part One

Soviet Experience

1 The System of Centralized Planning of the National Economy of the Soviet Union

In recent years, economic, scientific, and cultural ties between the Soviet Union and the United States have become more numerous and diverse. If we make an attempt to forecast the further development of these relations, we can conclude that the trend of extending mutual contacts in various fields will continue into the foreseeable future. "There are good prospects for our relations with the United States in future as well," said L. Brezhnev at the 25th Congress of the Communist Party of the Soviet Union (CPSU), "To the extent to which they will continue to develop on this jointly created realistic basis when, given the obvious differences between the class nature of the two states and between their ideologies, there is a firm intention to settle differences and disputes not by force, not by threats or sabre rattling, but by peaceful political means."

An important step toward improving relations between the Soviet and American peoples is the deepening of mutual understanding between them. For this, it is necessary to study more deeply the processes going on in various sectors of social life in both countries, to know specific characteristics of the countries' economic development.

An accurate representation of each other, a knowledge of actual conditions – this is the right path toward mutual understanding and good neighbor relations. In this light, the Soviet–American seminar for exchange of information about methods, forms, and tools for planning and forecasting in the Soviet Union and the United States takes on special significance.

Both by discussion of papers and by visits to enterprises and planning agencies, the seminar participants received first-hand information on methods and practices that managing groups apply to influence processes of production and economic development. This was a mutually beneficial collaboration that gave acquaintance with very complex and specialized approaches to planning and forecasting in the two countries in a relatively short period of time.

It is obvious that the practical experience of one country in planning cannot be mechanically transferred to the socioeconomic conditions of the other, since the experiences are fundamentally different qualitatively. However, exchanges about the practice of planning in different social systems not only broaden one's horizons but serve as a source of new ideas and possibilities as well. The Soviet authors have thus tried to acquaint readers, as fully as possible, with methodologies and practical means of centralized planning in the USSR and to show the effectiveness and the role of centralized planning in the light of objectives and tasks of building communist society in our country.

In the "Basic Directions of Development of the National Economy of the USSR for 1976–1980," adopted by the 25th Congress of the CPSU, there is a special section that provides for a complex of measures to be taken to aid further perfection of national economic planning in the USSR. The main directions of improving the quality of planning activity and of the plans themselves include at present (a) making the state plan economically based and better coordinated – that is, all targets of the state plan should be mutually coordinated; (b) turning the emphasis decisively toward improvement of production efficiency; (c) establishing closer connection between the plan and scientific–technological progress; and (d) perfecting planning for foreign economic relations.

From the point of view of economic practice, an economically based and stable plan must be a balanced plan that takes into account real possibilities of economic development. Only a carefully coordinated plan that provides stable maintenance of necessary proportions in national economy, individual branch industries, and economic regions can successfully fulfill its directive and coordinating functions.

Coordinating or balancing the national economic plan means coordinating the needs of society with the resources for their satisfaction. The norm of expenses (the fixed rates of expenses) for materials, labor, and financial resources per unit of production serves as the basic working tool for this coordination.

In the tenth 5-year plan, these elements of balancing the national economic plans are the center of attention in the organs of economic management. Working out the plan begins with the exposure of needs. In this connection, the system of socioeconomic forecasts becomes broader and the methodology for making them is improved. A deep analysis for a true evaluation of existing and future resources is conducted. The plan envisages the expansion of the reserves of the resources at the junctions of separate branches and at other main points of the national economy. An important prerequisite for improving the balancing of national economic plans is the creation of a system of economically based norms that set rigid limits on materials used to satisfy social needs. Here we come to another distinctive feature of the tenth 5-year plan: the establishment of higher targets for the growth of efficiency. Thus, the established targets for 1976–1980 for growth in labor productivity, reduction in specific consumption of fuel and energy and technological equipment are much higher than those indicated in the ninth 5-year plan.

The basic source for growth of productive efficiency is the broad utilization of

the achievements of contemporary science and technology. Therefore it has become necessary to improve the planning of scientific–technological progress and the introduction of that progress into the national economy.

Having established intensive targets for the growth of economic efficiency, the state plan created an increased demand in the enterprise collectives for massive utilization of scientific ideas for technical innovations, since only in such a way can the goal of increasing the productivity of labor and the economy of material resources be fulfilled while simultaneously improving the quality of production.

At the same time, the plan creates real opportunities for satisfying the growing demands of enterprises by broadening the scientific–technological potential of the country and stimulating more intensive utilization of it for the country's needs. With the help of the plan, the collective studies of many scientific institutes and other organizations are coordinated and directed toward the solution of pressing problems. The introduction of scientific developments into production is also planned beforehand. The unified and, in essence, continuous process of "research and development – creation of new technology – its utilization in the national economy" is thereby purposefully controlled. The beginning and end of separate stages of this process are provided by the plan through the precise coordination of time periods of one project and the beginning of another through the well-timed provision of the materials, labor, and financial resources of these projects, and the corresponding material stimulation of the workers with the help of prices, preferential credit, and bonuses as well.

One of the directions for improving planning in the USSR consists of providing for a broader participation of the Soviet Union in the international division of labor and increasing the role of foreign economic ties for the solution of national economic tasks and accelerating scientific–technological progress.

According to the plan, raw materials will continue to be a significant item of our export. It is planned, however, to increase the share of the most profitable raw materials, and to emphasize more preprocessing of the materials to be sold. A considerable increase in the export of raw materials will be provided for by compensational agreements. According to these agreements, our country is offered credits, equipment, and licenses to secure increased extraction and processing of raw materials and energy products. Repayment of credits is effected by means of the products turned out by those or other enterprises.

The plan strives for perfecting the balance pattern of our foreign trade by enlarging the share of the processing industry output. It is planned to extend the compensational agreements to include those industries, too.

A summary of the main directions of improvement in Soviet planning in the current 5-year plan shows that our methods, forms, and techniques are not regarded as eternal and fixed. They are constantly changing and improving in light of new tasks, new conditions for economic development, accumulated experience, and additions to scientific knowledge about the methods of planning. From one 5-year plan to the next, rates of growth, proportions, indices, and assumptions become

more scientifically sound, the balance in development of individual branches improves, and methods for basing all indices of the plan come closer to perfection.

Although the social function of planning is not specifically examined in the papers, the authors could not completely disengage their attention from it. Both the Soviet and the American authors recognize that they represent different social systems, in each of which planning performs its social function. The chapter by Mayer, Raizberg, and Rutgaizer, underlines that in the USSR "the approaches to raising the people's welfare in the system of the national economic plan are characterized by the fact that they reflect the principal aim of the development of social production and have a determining influence on the formation of goals for the national economic planning as a whole." At the same time, the American author Springer writes, "A business that will not eventually generate cash is a liability and a candidate for elimination from the portfolio."

It is especially significant that planning in the Soviet Union, which reflects the fact that all means of production are publicly owned, is carried on within the national economy as a whole and is of directive character; i.e., each task of a plan is addressed to some individual enterprise or organization that carries full responsibility for its fulfillment. State planning for the development of the national economy as a whole eliminates duplication in economic development and ensures steady growth of real income of the population, full employment of the labor force, and a stable level of both wholesale and retail prices.

As is evident from the American papers, there is no distinct consensus in the United States about the role of planning at the national level. "On the one extreme," Dill notes, "there are those such as Milton Friedman who would endorse planning only if done by firms or lower level economic units. On the other, there are those such as Galbraith and Harrington who argue that we have moved a long way – and should move still further – toward a centrally planned economy."

Before the reader studies the seminar papers, we would like to offer several introductory comments. As is well known, management and planning are necessary wherever a large number of people work together on the same common task. A solo musician plays himself, an orchestra needs a conductor. In the process of teamwork within the large collectives of modern enterprise, planning and management fulfill two basic functions. The first is organizational, providing coordination and integration of actions of individual specialized production units or individual workers, within the corresponding units managed. The second is social, providing social orientation of this labor coordination toward the achievement of defined social goals.

Although it is difficult in practice to separate these functions, the basic emphasis in the seminar papers was on mechanisms for fulfilling the first, the organization function of planning and management. Although the Soviet papers published in this book were written in 1974, the authors, in preparing their chapters for this book, have paid particular attention to updating their work. They have tried to give in

their papers a complete survey of the planning system at various levels of economic management.

The first 12 chapters deal with issues of organization of planning for the national economy as a whole. They examine the existing system of bodies involved in planning; the kinds of plans; their structure, content, and methods; and techniques for their development. The fundamentals of organization for long-range planning are described in detail. Features of long-range plans and their main sections are described and a system of indices and their functions are presented. It is shown that long-range planning in the USSR is organized in such a way that it provides that central planning bodies play a leading role at all levels and in all sections in the process of developing plans.

Of great significance in drawing up the state plan for development of the national economy is its scientific basis. Therefore, preplanning is gaining in importance, in particular in national economic forecasting, which is examined as an integral part of the multistaged planning process. In Chapter 4, for example, Kirichenko describes in detail the organization of forecasting in the Soviet Union, kinds of forecasts, and the main objectives before us.

In Chapters 5–10, the Soviet authors have tried to present a detailed analysis of the planning of the basic aspects of the national economic plan, to present first of all, planning for the raising of the living standard of the population and the organization of social planning.

The decision-making mechanism is shown for such spheres as wage increase, social insurance, and social security, personnel training, and housing construction. Significant attention is given to issues of price planning, since prices are an important instrument in the process of economic development, the instrument that reflects the interests of enterprises, amalgamations, collectives of working people, and individual employees. In Chapter 8, Belousov discusses the basic functions of prices, kinds of planned price, methodological principles for price formation, and methods for planning prices.

In the Soviet Union today, a scientific–technological revolution is under way. It signifies, as Chapter 7 states, transformation of all technical bases of production, beginning with the use of materials and energy processes and ending with machine systems, organizations and management methods, the place and the role of man in the society. The multifaceted nature of this process and the great influence it has on various aspects of the life of the society make it necessary that it be planned for, and also make such planning complex. Gvishiani, in Chapter 7, describes the organization of planning for development of science and technology in the Soviet Union and shows methods and forms of planning. A detailed description of state bodies concerned with working out unified technological policy is given here, and the existing types and structures of state plans for the development of science and technology are examined.

Questions connected with the perfection of the planning process through the broad use of mathematical methods and computer technology are discussed in

Chapter 10, and in Chapter 9, organization of planning for foreign trade in the Soviet Union is explained.

The remaining four Soviet chapters deal with the way planning is done at branch and regional levels. Issues of the organization of planning for industry branches and production amalgamations are examined through the example of the Volzhski Automobile Plant (Togliatti). It is shown that the perfection of forms and methods of centralized planning is directly related to the development of the initiative of the production units, the extension of forms of economic relations among enterprises, and the perfection of the cost-accounting system.

Egiazarian's chapter (Chapter 14) examines the system for stimulation, development, and fulfillment of intensive plans, which envisage the intensive use of all materials and labor resources for the full satisfaction of the needs of the national economy. Basic conditions for making and fulfilling intensive plans are described, and the system of indicators for evaluation of these plans is also analyzed.

The book also deals with issues of organization of planning in a large region (Chapter 12). Tasks of territorial management are discussed. The significance of this planning for the development of union and autonomous republics and all regions of the USSR and for solution of energy deficits in the European part of the Soviet Union is shown.

The Soviet authors have not tried to make a comparative analysis of the two systems of planning. We hope that readers can make the appropriate comparisons. Our task was significantly more modest: to provide food for thought and in exchange to get corresponding information for ourselves. We think that this task has been fulfilled by both sides.

2 Organization of Planning for the National Economy of the Soviet Union

G. V. Perov and G. Kh. Popov

THE SYSTEM OF PLANS

Planning for the national economy of the Soviet Union involves the elaboration of mutually coordinated and interconnected long-range (15 years or more) and medium-term (5 years) plans and current (annual) plans of social and economic development for the country. The leading role belongs to the long-range plans.

Long-term, 5-year, and annual plans for the development of social and economic life in our country are prepared by two groups: (a) the specially designated organizations for national economic planning at the levels of the Soviet Union as a whole, the union and autonomous republics, territories, regions, districts, and cities; and (b), within the limits of their authority, the managing bodies of various specialized branches of the national economy and of social and cultural life, again at the levels of the Soviet Union, the union republics, and down to local units.

Activities of all the planning organizations, as well as the activities of the management bodies connected with planning, are unified by the general state planning center – the State Planning Committee, or Gosplan, of the USSR – and in the union and autonomous republics by the Gosplans of the union and autonomous republics. All bodies of planning and management are interconnected, and together they comprise a single system engaged in planning the social and economic life of the country as a whole, under the general leadership of the Central Committee of the Communist Party of the Soviet Union (CPSU) and the Soviet Government.

From the top level down, this system consists of

1. Bodies of the USSR: the Gosplan of the USSR, the all-union and union republican ministries and departments (committees) of the USSR
2. Bodies of the union republics: the Gosplans of the union republics, union republican and republican ministries and departments

3. Bodies of the autonomous republics: the Gosplans of the autonomous republics, ministries and departments of the autonomous republics

4. Local bodies: territorial, regional, area, district, and city planning commissions and boards: departments of the executive committees of the local soviets of people's deputies

5. Production amalgamations, enterprises, and organizations

The Gosplan of the USSR develops long-range, medium-term, and current plans for the entire national economy. It also determines the plans for the ministries and departments of the USSR, as well as of union republics. The respective ministries and departments of the USSR work out more detailed centralized plans for development of the branches of the national economy and industry entrusted to them. Likewise, the Gosplans of the union republics compile plans for complex development of the entire economy of the union republics and, separately, plans for the development of enterprises and organizations under their management.

Spheres of planning are strictly separated but are coordinated in accordance with the state structure and the system of the organs of power and administration of the USSR and of the union and autonomous republics. In the Soviet Union, the following kinds of prospective (long-term, medium-term) and current plans have come into being:

The general state plan for the development of the national economy of the USSR

Plans of the ministries and departments of the USSR for their respective branches of the national economy and industry

Plans of the union republics for the economy of the republics as a whole and for the enterprises and organizations under their management

Plans of ministries and departments of the union republics relating to their respective branches

Plans of the autonomous republics relating to the economy of the republics as a whole and to the enterprises and organizations under the autonomous republics

Plans of the ministries and departments of the autonomous republics relating to their respective branches

Plans for the economies of territories, regions, areas, districts, and cities

Plans for the divisions of the executive committees of local soviets of people's deputies

Plans of production amalgamations, enterprises, and other kinds of organizations and establishments

All the plans mentioned above are interconnected and represent a single system, which ensures centralized planned leadership of the national economy and development of initiative by local organs and enterprises.

In this system of plans, the leading role belongs to the general state plan of the USSR, which is approved by a session of the Supreme Soviet of the USSR. It

determines rates and proportions for the development of the entire national economy; interbranch and interregional proportions and relations; centralized capital investments in various branches of the national economy and union republics; construction and location of major enterprises; proportional development of all the branches of the country's economy; and the most important tasks with respect to the production and distribution of output by ministries, departments, and union republics, including setting wages, salaries, and prices.

The general state plan views the national economy of the USSR as a single complex and provides for the establishment of correct, scientifically based proportions for its development, appropriate to the needs of society and to the all-round development of individuals.

Economic plans of the union republics and autonomous republics are approved by the supreme soviets of the union and autonomous republics. The economic plans of territories and regions are also approved by sessions of the regional and territorial soviets of people's deputies.

THE STRUCTURE AND INDICATORS OF THE PLAN FOR THE DEVELOPMENT OF THE NATIONAL ECONOMY

At present, the structure of the plan for the development of the national economy of the USSR can be represented in the following way:

Summary economic indicators characterizing the development of the national economy as a whole

The tasks relating to scientific research projects and introduction of the achievements of science and technology into the national economy

The main tasks relating to the output of industrial production

Indicators for development of agriculture and forestry

Tasks relating to capital construction

Indicators for the development of geologic prospecting work

Indicators relating to labor, training, and allocation of manpower

Tasks relating to profits, production costs, and turnover

Tasks relating to the development of retail outlets and food service establishments

Tasks relating to the development of services and public utilities

Tasks relating to the development of public education, culture, and health services

A summary of tasks relating to the improvement of the standard of living of the population

Tasks relating to the development of the economy and culture of the union republics

Indicators for development of foreign trade relations

Material balances for the main types of production

The initial summary section contains comprehensive indices of development for the national economy as a whole – the rates of growth of aggregate public production, national income and its distribution for accumulation and consumption, along with rates of growth of industrial production, agriculture, and other activities.

The section on scientific research work and utilization of the achievements of science and technology in the national economy is one of the most important in the state plan. This section includes tasks relating to the mastering of new types of industrial production, the fastest possible utilization of the achievements of science and technology, introduction of advanced technology, mechanization and automation of production, and creation of automatic control systems.

Of extraordinarily great importance is the commissioning of new enterprises and reconstruction of existing ones on the basis of the most recent achievements of science and technology. Elaboration of capital construction plans includes planning of capital investments, project research work by project-design organizations, as well as construction itself and the development of the capacities of building and assembling organizations.

A special section of the plan is set aside for the problems of labor. These include the training of manpower, utilization of manpower resources, efforts to raise the productivity of labor in different branches of the national economy and industry, regulation of the remuneration of labor, policies on bonus payments, and plans for utilization of the wages fund.

Growth of the efficiency of social production is impossible without a correct planning of profitability, control of the costs of production and turnover, and incentives to stimulate production. In the plan the system of financial indicators is included.

Issues of raising the standard of living in the plan are dealt with in a whole series of sections. Apart from the section specially fixing the indices for the growth of the living standard and the structure of meeting different requirements of people in different settings (cities vs. rural areas, for example), special sections envisage the development of trade, of everyday services for the population, municipal programs, public education, and culture and health services.

Another section of the plan is devoted to the planning of foreign economic relations.

Finally, compilation of the national economic plan is completed by the development of the balances and the plans for the distribution of the most important types of production, for provision of materials for production and capital construction, for provision of cultural and health services, and for deliveries of production into the general union fund and into the state reserve.

There are two sides to the reconciliation of the branch and territorial aspects of the national economic plan. On the one hand is the establishment of the tasks of the national economic plan for union republics and economic regions itemized by branches, ministries, and departments. On the other hand is the establishment of the tasks of the national economic plan for each particular branch of the national

economy, ministry, department, itemized by union republics and economic regions. On the basis of the combination of the interests of the entire country and each union republic, rational distribution of productive forces is determined, and measures are worked out for their most effective utilization to meet the requirements of society at the lowest cost of production.

In the final reckoning, the tasks of the plan characterize the dynamics and rates of development of the national economy and the qualitative shifts that must be achieved by the end of the planning period. The magnitude of a task is expressed both in absolute indices (volume of output of production, average monthly wages, real income per capita, level of consumption, and so on) and in relative indices (for example, percentage of growth, percentage of increase). Plan indices relating to each branch have their special features, depending on the specific character of the branch (e.g., industry, agriculture, transport, popular education) and are generalized in comprehensive indices of the summary section of the plan. This section coordinates the indices of all the branch sections of the plan and, together with them, constitutes a single system of quantitative and qualitative indices characterizing the national economic plan as a whole.

Plan tasks in the production sphere are fixed in both monetary and physical terms. National income and its distribution for consumption and assets accumulation, rates and proportions of national economic development, productivity of labor, capital investments in the national economy, movement of the basic production funds, fund returns, economic efficiency of capital investments and production, profits – all these are planned in units of monetary value. All the tasks relating to the output of concrete types of production are planned in physical terms. Some tasks, such as those relating to the productivity of labor in particular branches (for instance, in coal mining) and to commodity turnover, are planned both in monetary and physical terms.

Value indices are calculated both in the current prices at which real economic turnover takes place and in fixed prices for the measurement of the physical volume of production and consumption.

In the course of planning the tasks, a great number of calculated indices are worked out, such as normative indices of production costs, normative indices of the output of production per unit of raw material, and indices of specific capital investments. These calculation indices of planning are necessary for the justification of the tasks approved in the plan.

On the basis of the national economic plan of the USSR and of the plans of union republics, autonomous republics, territories, regions, the appropriate agencies of administration determine the following indicators for their enterprises, production amalgamations, and similar organizations:

The total volume of marketable output

Output of the most important types of production in physical terms

The sum of profit and return on investment (with regard to the sum of basic production funds and working assets)

Payments to the budget and allocations from the budget

The general wages fund

Growth of the productivity of labor

The volume of centralized capital investments, including the volume of construction and assembly works

Putting into operation of basic funds and production capacities at the cost of centralized capital investments

The tasks with regard to the mastering of new types of production, to the introduction of new technological processes, and to integrated mechanization and automation of production that are of particular importance for the development of an industry

The volume of deliveries to consumers of raw materials, materials, and equipment distributed by a higher organization

Based on the above scheme, each branch of industry has its own subsystem of indices that are approved for its enterprises.

In the sphere of nonproduction services there is also a subsystem of indices of the national economic plan and of tasks approved for service enterprises and establishments. In the plan for public education, for instance, the number of schools and preschool establishments and the number of children attending schools and kindergartens are of great importance. In the case of health services there are indices of the number of hospitals, hospital beds, doctors, and so on. Using a broad system of calculation for the network of establishments, indices of service personnel, wages, cost of maintenance, equipment, and quality of the work of the establishment are applied.

The structure and indices of the plans do not remain unchangeable; they are being perfected and will continue to be perfected in the future.

PROCEDURES FOR ELABORATING THE NATIONAL ECONOMIC PLAN

ELABORATION OF THE LONG-RANGE PLANS

Work on the drafting of a long-range plan starts with an analysis of the state of the economy, an evaluation of the fulfillment of the current plan, and a general assessment of the needs of the society and the degree to which they are being satisfied. In addition, the perspective of the development of material and nonmaterial needs of the society is defined with regard to social and occupational groups of the population, geographic and climatic zones, republics, economic regions, and other categorizations. Consideration is given to basic directions for the development of science and technology and to specific social problems that must be solved during the plan period; to decisions about rates and priorities for economic development; and to the principal tasks and directions for the development of individual industries and branches of the economy.

The ministries, departments, and councils of ministers of the union republics work out proposals to relate their analysis of needs to the main directions of the development of the national economy. Particular attention is paid to preliminary calculations of scientific and technological progress. Councils of ministers of the union republics also prepare conclusions on technical and economic reports and proposals that are prepared by all-union and union-republican bodies. At the same time, the State Committee of the Council of Ministers of the USSR for Science and Technology and the Academy of Sciences, together with interested ministries and departments, work out the main integrating lines for development of science and technology and for the utilization of their achievements in the national economy.

The Ministry of Geology, the State Committee of Forestry of the Council of Ministers, the Ministry of Agriculture, the Ministry of Power Industry and Electrification, and the Ministry of Land Improvement and Water Resources all prepare proposals for the utilization of natural resources itemized by economic regions.

All the prepared proposals go to the Gosplan, which on the basis of these proposals and its own calculations of society's needs and of the resources for their satisfaction, prepares a draft of the main lines of development of the national economy for the long run. The draft is then submitted to the Government of the USSR for consideration.

After the draft long-range plan has been approved by the Central Committee of the CPSU and the Council of Ministers of the USSR, the Gosplan of the USSR, the ministries and departments of the USSR, and the councils of ministers of the union republics go back to work out (in the same order as the draft of the main lines) their long-range draft tasks for technical and economic development of the national economy and for the production and distribution of material and nonmaterial wealth within the union republics and economic regions.

After studying the proposals by the ministries, departments, and scientific establishments, the Gosplan of the USSR works out a draft of directives with regard to the plan and the main indices for the development of the national economy. These are submitted again to the Central Committee of the CPSU and the Council of Ministers of the USSR.

The Central Committee of the CPSU and the Council of Ministers of the USSR consider the new draft and the divergent opinions of the ministries, departments, union republics, and institutes. They make decisions, introducing into the draft the necessary corrections and changes. The draft directives of the Central Committee and the Council of Ministers are published in the press, and wide discussion follows at party congresses and conferences, meetings of workers and collective farmers, and in other forums. Then the Central Committee reports to the national Congress of the Communist Party and drafts directives with respect to the long-range plan and the results of the pre-Congress discussions of it. The Congress discusses the report on the draft and the proposals submitted in the course of the pre-Congress consideration and adopts directives with respect to the long-range plan.

Upon authorization by the Central Committee and the Council of Ministers,

the Gosplan of the USSR drafts a more detailed plan, with participation of the ministries and departments of the USSR, the councils of ministers of the union republics, the Academy of Sciences of the USSR and the All-Union Central Council of Trade Unions (VTsSPS) on the basis of their proposals prepared in accordance with the directives of the Party Congress. The result is submitted to the Council of Ministers of the USSR which considers it in consultation with the ministries and departments of the USSR and the Councils of Ministers of the Union Republics. This draft plan is considered and approved by the Central Committee of the CPSU.

The detailed draft long-range plan, adopted and approved by the Central Committee of the CPSU and the Council of Ministers of the USSR, is submitted to the Supreme Soviet of the USSR, where it is first considered by the planning and budgetary commissions of the Soviet of the Union and the Soviet of the Nationalities. They hear reports from the Gosplan of the USSR, the ministries and departments of the USSR, and the ministries and departments of the union republics. Afterwards, the draft plan is considered part by part by branch commissions of the Soviet of the Union and the Soviet of the Nationalities – by the commissions for industry, transport, and communications; for the construction and building material industry; for agriculture; for environmental protection and conservation of resources; for health service and social security; for public education, science, and culture; and for trade and everyday services.

The session of the Supreme Soviet of the USSR reviews the draft plan along with the conclusions reached about it by the reviewing commissions. It then formalizes the approved version by adopting a Law on the State Plan for the Development of the National Economy of the USSR.

The plans approved by the Supreme Soviet of the USSR, by the supreme soviets of the union and autonomous republics, and by territorial, regional, area, district, and city soviets of people's deputies are sent down to the appropriate organs of administration, which convey them to each enterprise, production amalgamation, and establishment under their supervision. The enterprises, production amalgamations, and other organizations finally adopt their own long-range plans in accordance with the plan assigned to them.

ELABORATION OF ANNUAL PLANS

Elaboration of the annual national economic plan is preceded by an all-round analysis of the development of the economy, on the basis of which the tasks of the 5-year plan for the planned year are specified more precisely with regard to the most important indices. The Gosplan informs the ministries, departments, and councils of ministers of the union republics about possible changes in the indicators of the national economic 5-year plan for the coming year.

The ministries and departments work out the annual plan draft, which sets tasks for production units and amalgamations, taking into account the proposals made by the Gosplan.

Gosplans of the union republics draw up plans for the development of the branches of the economy that are under republican supervision and submit to Gosplan of the USSR proposals with regard to the development of production at enterprises subordinated to the all-union ministries.

On the basis of all these proposals, the Gosplan draws up a draft of the annual State Plan for Development of the National Economy. After consideration of this draft project by the Council of Ministers of the USSR and the Central Committee of the CPSU, it is submitted to the Supreme Soviet of the USSR.

The draft plan is considered by the permanent commissions of the Supreme Soviet with participation of the ministries, departments, and Gosplan of the USSR and is discussed afterwards at a session of the Supreme Soviet. Taking into account the amendments and supplements submitted by the deputies, the Supreme Soviet adopts a Law on the State Plan of Development of the National Economy of the USSR.

The procedure for consideration and approval of the annual plans in the union republics and autonomous republics is the same.

ORGANIZATION OF WORK AT THE GOSPLAN OF THE USSR

Elaboration of long-range and current national economic plans at the Gosplan is a process of interaction among all its departments. The Chairman of the Gosplan issues orders about procedure and terms for elaboration of the plan by Gosplan departments in accordance with the decision of the Council of Ministers of the USSR that has set the main lines, the procedure, and time for elaboration of the plan.

On the basis of the proposals from the ministries, departments, and union republics and of preliminary general calculations made to summarize rates and proportions for the development of the national economy, departments of the Gosplan determine the development of the respective branches. They examine the needs of society, match requirements against resources, and assign projects to the appropriate departments that are engaged in balancing. Within each group of adjacent branches, projects are coordinated by an appropriate deputy chairman of the Gosplan of the USSR.

After the plan projects are coordinated with the departments charged with balancing specific needs and resources, branch departments submit them to the leadership of the Gosplan of the USSR. They also submit these projects to the department responsible for synthesizing the national economic plan. Appropriate sections of the draft are sent to the department of territorial planning and distribution of productive forces, to the general department for capital investments, the general department for raw material balances and distribution logistics, and to the departments concerned with balances: departments of norms and standards, productivity of labor, finance, cost analysis, construction, science and technology, local industry, services, and so on.

The department that synthesizes the national economic plan considers the

projects of all the departments from the point of view of their correspondence to the main lines of development of the national economy pointed out by the decisions of the Central Committee of the CPSU and the Government of the USSR. If there is any disagreement between branch draft plans and the general national economic draft plans, the leadership of the Gosplan issues instructions about the redrafting or partial modification of the branch drafts. Modified drafts are summed up again by the synthesizing department and are submitted by the latter with its conclusions and remarks for consideration by the Gosplan Collegium.

The Gosplan Collegium considers the refined drafts; it also considers the remarks made by Gosplan departments as well as ministries and Gosplans of the union republics. The Collegium makes corrections and offers general guidelines for preparation of the draft national economic plan. This draft is finally prepared by the synthesizing division in accordance with the decision of the Collegium, under the direct guidance of the Chairman of the Gosplan, with the involvement of deputy chairmen and heads of divisions. It then goes back to the Collegium for approval. The Collegium then entrusts the chairman with submitting the plan to the Government.

3 Methods for Justification and Adoption of Planning Decisions at the Level of the National Economy

L. Y. Berri

The development of a socialist economy is based upon centralized management and a unified plan. Centralized planning constitutes the key element of the economic management of the USSR.

An overall national economic plan, which subsumes particular plans for the development of individual branches of industry, as well as plans for the individual republics, districts and regions, enterprises, amalgamations, and other organizations, is worked out on profound democratic principles. Soviet planners believe that macroproportions can only be established by the higher levels on the basis of complete information about the state of the economy as a whole. On the other hand, the setting of microproportions and the tapping of potential sources for the further development of production and better utilization of fixed assets and manpower may be also effected by the lower levels. An organic unity between centralized planning and a certain independence in making planning decisions at the lower levels of the economy is important to improve the efficiency of social production.

The planned management of the economy in the Soviet Union is organized in such a way that the areas covered by the central plan and the plans for particular industry branches, republics, and localities are strictly delimited. Each economic unit in the economic system should cope with the questions with which it is most competent to deal because it is in possession of the most complete information on these questions and is directly interested in and responsible for their resolution.

As extensive experience of the socialist countries and of the Soviet Union, in particular, has shown, centralized planning can be effective only if it relies on the initiative and creative activity of production collectives and organizations. Centralized planning ensures the lasting economic stability of each individual production unit, the value of its status, and the prospects for its development in the social system for division of labor.

Decision making in planning on a national scale involves the working out of

summary indicators for the macroplan. These include indicators for economic growth rates (growth rates of national income and final product), for the ratio of the consumption funds to accumulation funds in the national income, for the total amount of resources available for investment and the main directions of their utilization, and for the amount of reserve labor force for the period covered by the plan. The domain of the macroplan also covers planning of the overall policy for science and technology of the most important intersectoral and interregional proportions and relations, planning of large-scale construction projects of national importance, and planning of the location of these projects. The macroplan also deals with the major problems of social relations.

Planning at the national level has sectoral, territorial, and programmatic aspects. Planners work both with planning of particular branches and territories and with large-scale interbranch and interdistrict programs that are later referred to in working out plans for the development of particular branches and districts, and hence have their place in the comprehensive plan for the entire economy. The drawing up of the national economic plan is iterative in character. It requires an exchange of information among the different parts of the system of planning offices.

The planned management of a unified socialist economy from a single center is accomplished by a combination of planning by directives and the use of economic levers (e.g., prices, credit, profits) that are applied to the process of economic development in accordance with the major tasks set by the plan. This provides for unification of the economic interests of the enterprises, amalgamations, and production collectives.

To these ends, the government determines price policy (wholesale, purchasing for agricultural goods, and retail). On the basis of state principles of price formation, special government agencies for price formation ratify the prices for the most important production and consumer goods. But the higher state agencies cannot and must not fix all prices. Some certain volume of the national product is sold at prices set by local agencies and by the producing enterprises themselves on the basis of a consensus reached with consuming enterprises. In addition, both central and local price-setting agencies modify prices to conform to changes in the conditions of production and sales. An intimate correlation exists between price stability and price elasticity. The planning of prices should be organically tied in with the basic parameters of the national economic plan.

The government establishes general conditions for wages, determines the proportion of profit an enterprise should allocate back into its budget and the portion it may use to provide incentives for its workers, recreational and entertainment facilities, and growth of production. The government also sets credit rates and other standards. All these levers are used to stimulate plan fulfillment and improve the functioning of the economic system.

THE IMPORTANCE OF PREPLAN STUDIES

A number of preplan studies precede plan decision making. These studies include analysis of the initial level of economic development, determination of the goals of socioeconomic development in the planning period, and the working out of forecasts on major problems.

An analysis of the initial level of development of the economy reached by the beginning of the plan period is of crucial importance for planning. In the years ahead, the growth of social production is predetermined to a large extent by the existing production capacities, the labor resources, and other conditions of the preplan period.

An analysis of the initial level of the development of the economy, especially an analysis of actual economic processes and of trends of the preplan period, plays an important part in the process of framing a long-range plan as well. Study of economic growth in the preplan period includes volume, rates, production proportions, the degree to which social needs are satisfied, and a determination of the reserves that may be drawn on for improving the effectiveness of social production.

The longer the plan period, the greater the opportunity for implementing large-scale socioeconomic measures, and the greater the importance of a *choice of goals for economic growth over the long term.* A choice of goals for economic growth also provides a starting point for current planning; however, this choice is predetermined to a larger extent by the actual state of the national economy. The guidelines of a 5-year plan are defined by the Communist Party Congresses.

At present, the following are some of the major long-term goals of our socialist economy: maximal satisfaction of the material and cultural needs of the members of society; strengthening and development of social relations; creation of economic potential for the future; strengthening of the defense capacity of the country; maintenance of a good environment; and strengthening and development of the relationships among the socialist countries. The distribution of resources to be used to achieve these goals in a socialist society is based on a thorough economic and political analysis of the concrete features of each planning period.

Each major national goal can be divided into several subgoals. For example, the maximal satisfaction of the material needs of the members of society can be subdivided into subgoals, such as the satisfaction of the needs of people as regards food, clothing, housing, means of communication, and health services. In turn, each of these classes of needs includes a series of subdivisions that constitute a third level of goals. A deep understanding of the socioeconomic goals of the society as a whole is an absolute prerequisite for making any planning decision on a national level.

Long-term forecasting is used in the preplanning stage to determine possible alternatives for technical, economic, and social development over the long term. Knowing such alternatives, one may proceed to working out national plans and to select the most efficient and realistic alternative for long-term and 5-year plans. The development of these alternatives during the process of forecasting involves first an appreciation of the general goals of socioeconomic development, of the trends in

the preplanning period, and of projected variations in the effects of factors of economic growth in future such as may bring about a shift in current trends and the formation of new socioeconomic processes.

For any given existing state of the economy and for any given goals toward which the society is consciously striving, there are a number of objectively possible alternatives for economic growth. For this reason, long-term forecasting necessarily involves a number of alternatives. In addition, the probabilistic nature of many economic growth in the future such as may bring about a shift in current trends and

Forecasting and planning are closely interrelated processes – indeed, they are a stage in a single process. Forecasting is an analytic prerequisite of planning. The most important aspect of forecasting is the discernment of the objective trends of economic development. Unlike forecasting, planning is of a directive character, and plans are made for specific ministries, enterprises, and organizations. The most important aspect of planning is the making of decisions and the quest for concrete ways of achieving the stipulated goals over the long term.

Our experience with forecasting in the USSR allows us to make the following classification of forecasts:

- Forecasts of the development of science and technology and their effects on the development of the nation's economy
- Demographic forecasts and forecasts of labor resources.
- Forecasts concerning natural resources and their use in the economy.
- Economic forecasts. This is a large group that includes forecasts of such things as basic funds and investments, economic growth and structural changes, living standards and levels of consumer demand, social production and services, and foreign economic relations. Since a major goal is to improve the standard of living of the population, studies of the formation and the dynamics of social needs and forecasts of consumer goods and services are of top priority.
- Social forecasts. These cover social processes and ways of solving the main problems that arise during the process of building communist society.
- Sectoral and regional forecasts. These are a necessary element in the system of long-term planning and forecasting and include forecasts of the development of particular sectors of production of products and services, as well as the development of particular economic regions.

METHODS OF PLANNING FOR THE NATIONAL ECONOMY

In drawing up a plan, specific methods that correspond to the tasks and features of planning are used. The chief methods of planning of social production are balance methods, which ensure that plans are balanced out against one another, and methods of optimization of plan decisions, which help to increase the effectiveness of social production. These methods are interrelated and supplement one another.

Balance methods involve the coordination of needs and resources at the level of overall social production, the coordination of neighboring sectors and production units, and the maintenance of proportions and coordination among all aspects of the national economy. Balance methods make it possible to maintain and coordinate material and cost proportions in the national economy on a planning basis, and in this way to ensure the cohesiveness of plans. In the actual practice of planning, material, financial, and labor balances are used; these are intimately interrelated and reflect different aspects of a single process of expanding social production.

The coordination of the production and consumption of some types of products is done with the aid of material balances (for steel and electricity, for example) that show the resources available and the need for them in a particular branch of production. These balances demonstrate the interrelatedness of the different branches of production. The balances of fixed assets and production capacities are directly associated with material balances. These make it possible to determine the extent of a required increase in productive capacities and fixed assets to achieve the planned volume of production.

Balances of labor resources are important for ensuring the necessary labor force for fulfillment of the planned volume of production and the development of the service sector. These balances compare the labor reserves available and the labor force needed during the planned period. The balances of labor resources are compiled for the USSR as a whole, for the different republics, and for particular regions. They make it possible to plan the distribution of labor resources among the different sectors and regions of the economy and to plan the training of personnel.

The financial balances reflect the formation and distribution of state incomes, the incomes of socialist enterprises, and incomes of the population at large. The major balance items are the balances of the incomes and expenditures of the government and the balance of the money incomes and expenditures of the population for the USSR as a whole, for the union republics, and for regions and districts. The balances of the money incomes and expenditures of the population are necessary to determine demand for goods and services, to plan the volume of production of consumer goods and retail sales, to plan services for the population that require payment, to work out the cash plan of the State Bank, and so on.

The material, labor, and financial balances must be strictly tied together into a single whole. All types of balances are tied in within the framework of the balance of the national economy, which therefore occupies a special position in the system of balances. The balance of the national economy includes the balance of production, consumption, and accumulation of the social product, and the balance of the production, distribution, and redistribution and use of the national income. The plan balance of the national economy characterizes the overall economic proportions of social production.

The intersectoral balance of production and distribution of the national economic output is a further development of the national balance. It organically unites overall economic proportions with the particular proportions existing within a

sector. For example, the planned intersectoral balance in 1970 reflected relationships among 130 sectors of the national economy.

The cross-product balance, i.e., the intersectoral balance expressed in terms of production items, is a synthesis of all the material balances. The balance for 1970 listed 585 items. Intersectoral balances expressed in terms of production items and values are now being worked out. The use of intersectoral balances is an important addition to the current system of plan accounting in terms of balances.

Although the most effective alternative of plan decisions may be chosen by comparing several types of plan decisions for their economic effectiveness, this is no guarantee that the type chosen will be the optimal, since an optimal alternative may lie beyond those developed alternatives whose effectiveness is being compared. However, a comparison and analysis of the economic effectiveness of several alternatives is undoubtedly an aid to raising the effectiveness of social production in the plan period.

In the existing procedure used to compare the economic effectiveness of interchangeable types of production, indicators of investments per unit of production, direct cost per unit of production, or present value cost (total direct cost plus coefficient of effectiveness multiplied by the required volume of investments) are used as criteria of optimality. The most effective alternative is the one characterized by the lowest figures for these indicators.

To determine the economic effectiveness of different alternatives for the volume and structure of investments, several indicators are used: Among them are the coefficient of overall economic effectivenesss defined as the ratio of net production to the sum of investments; and the coefficients of comparative effectiveness, calculated as the ratio of total saving from the decrease in direct costs of production in the last year of the planning period to the investments made during the planning period. These indicators allow the choice of the most effective focus of investments.

Mathematical programming methods make it possible to select the most effective alternative from the point of view of the selected criteria. These methods have already demonstrated their versatility in the solution of a number of local and sectoral problems.

Mathematical methods of modeling make it possible to express quantitative relations between given indicators in mathematical form and to find a group of possible plan alternative solutions. Mathematical methods are used in the solution of balancing problems and problems concerning the choice of the most effective alternatives of economic development. Mathematics helps to ensure that the balance method and the method of selecting effective solutions become genuinely scientific methods. The modeling should, however, be based on concrete description of economic processes, which in turn is based on a specific and thorough analysis of how they work.

Norms for the expenditure of labor, materials, raw materials, fuel, and equipment are important elements in any method of plan accounting. The computation of material, financial, and labor balances should be based on scientifically sound

norms. The choice of effective plan solutions requires a comparison of various alternatives for developing production, and norms are in turn applied in computing each alternative. Optimization of plan decisions does on the whole require the further development and improvement of the system of norms.

Drawing up a comprehensive plan for the entire national economy requires a comprehensive approach. The comprehensiveness of the national economic plans, as plans for socioeconomic development of the country, lies in the fact that they encompass as an integral whole general goals, large-scale programs and resources, and plans for all economic sectors and regions. Only if this is so is it possible to ensure that the sectoral and territorial aspects of the national economic plan are organically tied together.

Planning must also be broadly conceived when the different sections of the national economic plan are worked out. Thus, for example, the development of a production plan requires knowledge of the construction program. The production plan must take into account the needs for construction materials and building equipment. Such an organic relationship exists among the dynamics of production, the number of persons employed in production, their incomes, and their needs. The dynamics of production determines the consumption of material wealth; by the same token, this consumption influences the volume and structure of production.

Comprehensive economic plans require the use of a system of interrelated economic and mathematical models, which include macromodels of economic development and intersectoral balances for the national economy, as well as models for optimal sectoral plans. The conditions are now ripe for the practical implementation of the following set of economic and mathematical models for planning:

Macromodels of economic development

Intersectoral models:

Aggregated dynamic intersectoral model

Detailed, intersectoral models in value terms; intersectoral balances expressed in terms of production items and values, and intersectoral balances expressed in terms of production items alone

Models of optimal plans for the development and allocation of production in various sectors

Macromodels for economic growth form the basis for determining the main indicators for national economic development, economic effectiveness, and correlation of extensive and intensive ways of economic growth. Macromodels make it possible to compute the principal indicators of the national economy, such as growth rates of national income, gross national product, final product, the correlation between consumption and accumulation funds, production of means of production and production of consumer goods, the correlation between the productive and nonproductive spheres, resources needed for investments, labor resources, growth rates of productivity, and the volume of production per ruble of fixed assets. The indicators

for final product, national income, and nonproductive consumption are then used to work out intersectoral models.

Intersectoral balances are used to determine the structure of social production and the rates and proportions of the development of the various sectors of the national economy and to determine the balanced volumes of production in all sectors included on the intersectoral balance list. The use of these balances in all stages of planning facilitates the attainment of a truly well-balanced plan.

Either the total final product, the major portion of which is the disposable national income (consumption and accumulation funds), or only the consumption fund and nonproductive accumulation (net product) can be used as the starting point for planning the volume and structure of social production. The latter choice is especially important for long-term planning. Indeed, the production of tools (elements of fixed production assets) in the final analysis contributes to the expansion of production of objects of consumption. Hence, the scale of production of fixed assets (capital construction) can and should be calculated with a view, in the first instance, toward long-term expansion of the production of objects of consumption, housing construction, and construction of schools and hospitals, and toward strengthening our country's defenses.

After calculating basic social needs, the second most important step in compiling planned intersectoral balances is the development of plan coefficients of direct expenditures.

The development of an intersectoral plan balance entails essentially the compilation of a production program for all the principal sectors of production on the basis of figures for basic social needs and norms for expenditures. This production program will then serve as a framework for the plan and as a reference point for detailed projections in the various sectors and regions and then for the plans of enterprises themselves. The more items there are represented in the intersectoral balance, the more detailed will be the indicators of this comprehensive production program for the economy.

A factor of fundamental importance is determination of the volume and structure of the social product, of the volume and structure of production investments on the basis of indicators for the consumption and nonproductive accumulation funds, and of progressive indicators for material intensity and asset intensity. A determination of these parameters paves the way for an accurate assessment of the correlation between production of the means of production and production of objects of consumption.

A plan outlines the growth of production of means of production, as that growth is organically linked to the needs of the population. This is the essence of socialist planning, for which growth of the production of the means of production is not a goal in itself, but a means towards the resolution of the tasks involved in the building of communism.

Two types of intersectoral models are used in the Soviet Union. In the first stage, a general dynamic model for an intersectoral balance, covering 18 sectors, is worked

out. Given the volume and structure of nonproductive consumption (consumption fund and nonproductive accumulation), this model is then used to determine the volume of production and productive investments in the principal areas of social production and the main sectors of industry. It is very important here to work out several alternatives for the generalized dynamic model. These alternatives will differ in terms of the growth rates of nonproductive consumption and its elements, which are given in the model. The most effective alternatives should then be chosen.

The generalized dynamic model for intersectoral balance is then used to work out more itemized static balance models. These balances, expressed in value terms, cover over 100 sectors. An attempt is currently being made to work out balances, in terms of production items and values, by which specific ministries of the economy will be designated, hence ensuring that intersectoral balances will be specifically addressed; this is more in line with the current planning practices.

A comprehensive, programmatic approach to planning and to large-scale economic decision making is obviously a necessity. This makes it possible to work out long-term, large-scale programs and ensures the achievement of important economic and social goals, the implementation of which requires the coordinated efforts of numerous sectors and economic regions.

As a rule, large programs cover several sectors and are of national importance. For example, the government program for expansion of agriculture requires the participation of the chemical industry, the machine tool industry, the construction industry, and many others. The same is true of large-scale regional programs, which require the participation not only of many sectors of industry but also of several economic regions as well.

Large-scale comprehensive programs may be compiled for periods of varying duration and may be worked out in several versions. They are wholly or partially included in the specific long-term plans of economic development. A large-scale program includes several more specific programs, each of which should be analyzed and evaluated from the point of view of effectiveness and the amount of resources consumed in its implementation. All the comprehensive programs are then examined together from the viewpoint of the importance and priority of the goals the programs were meant to cover. The programs are then ranked (i.e., classified as first-order, second-order, and so on).

Planning decisions at the level of the national economy include plans for the development of specific industrial sectors and plans for the location of production facilities. The optimal sectoral plans make it possible to select the most economical approaches to the reconstruction and expansion of existing enterprises and the construction of new ones. These plans determine where new factories should be placed. They set the optimal sizes and profiles of specialization for newly built or newly remodeled enterprises, and they specify the degree of their mechanization and automation. Alongside the traditional feasibility and balance calculation method systematically used in working out sectoral development plans, studies are being done in the USSR to determine optimal long-term plans for the development and

and location of industry. In addition studies are progressing on the development of optimal energy balances. Optimal planning methods are being introduced chiefly into sectors that concentrate on a single product.

Optimal plans are now being worked on for the majority of sectors and areas of industry; sectoral procedures have been worked out and approved in many ministries. The criterion for optimal sectoral plans is a minimum present value cost, including the costs of transporting a product to its place of consumption, for a given volume of production. In several models, the effectiveness of utilization of the product is also taken into account.

Among the most important input data for designing an optimal sectoral plan is the demand for each type of product produced by a given sector. The demand is determined for both the entire country and each region. This information is still obtained by traditional methods, but ultimately, systematic development of long-term intersectoral and interterritorial balances for the entire USSR will enable us to obtain data on the need for the product of a given sector on the basis of these balances. In this way, the models for the national economy and the optimal sectoral models will be organically linked.

4 Organization for Long-Term Planning and Scientific-Technological Forecasting

V. N. Kirichenko

The system of national economic development plans now in effect in the USSR includes long-term, medium-term (for 5 years), and current (for 1 year) plans. The first long-term plan was worked out in 1920 for the electrification of the country (the GOELRO Plan). The core of the plan was the task of transforming the development of production through widespread use of electric power and of creating a network of large electrical power plants. On this basis, lines of the development for the main sectors of the national economy and of the economic regions of the country were determined. The GOELRO Plan laid the foundations for the methodology of long-term planning in the USSR.

In the subsequent period, elaborations of programs were carried out for long-term development of other national industry sectors, of territorial production complexes, and of economic development of individual regions of the country. At the end of the fifties and the beginning of the sixties, a complex plan was worked out for development of the national economy of the USSR for the period 1961–1980. At present, the planning and economic organs of the USSR are elaborating a long-term plan for development of the national economy until 1990. This long-term plan will include the following divisions and directions:

The main social and economic tasks, and the degree and terms of their solution in the long-term perspective

Improvement of the people's well-being

Development of science and consistency of scientific research, along with strengthening of the material basis of science

General economic parameters for the development of the national economy – rates of growth, proportions, and balance

Overall development of the productive forces of the socialist society –planning and use of labor resources, scientific and technological progress and efficiency of

social production, development of groups of industries and of individual major industries, location of productive forces, natural resources, and so on

The most important integrated programs ensuring achievement of major social, economic, and technical tasks

Development of foreign economic relations and especially the development of socialist economic integration with the member countries of the Council of Mutual Economic Assistance (CMEA) and other socialist countries

The means and forms of improvement of the organization of social production and economic management

Plan drafting is done by the joint efforts of ministries and departments, union republic planning bodies, and research institutions of the USSR Academy of Sciences and other organizations, with the USSR Gosplan at the head. The plan is developed for individual sectors of the national economy, union republics, consolidated economic regions, and significant comprehensive intersectoral problems of the national economy. All divisions of the plan must contain qualitative and quantitative indicators of development (levels, stages, means) and specific program indicators revealing the effectiveness of the adopted decisions.

ORGANIZATION AND METHODOLOGY

The organization and methodology for developing the long-term plan for the national economy take into account present-day planning requirements that result from a huge increase in the scale and complexity of the structure of production, a revolution in science and technology, and a growth in the interrelation and interdependence of different aspects of social life. Of these requirements, the following can be pointed out:

- Enlarging the circle of tasks of advancing social and economic production that are solved simultaneously and that can be reflected in the plan, as well as the circle of factors that have to be taken into account when planning decisions are being prepared.
- Shifting the zone of search for development goals to an increasing degree into the social sphere, and of the means for achieving them into the sphere of acceleration of scientific and technological progress, and an all-out intensification in utilizing the resources of production. That is, in planning the national economy, more attention and space are to be given to problems of social development, acceleration of scientific and technological progress and utilization of its achievements, external factors in economic growth, and satisfaction of social needs.
- Ensuring, in the process of planning, an integral analysis of economic problems and justification of planning decisions, the primacy of the national economic aims

and criteria, an integrated national economic approach, accumulation of scientific information on the problems considered in the plans, integration of this information when preparing planning decisions, and wide application of methods of economic and mathematical modeling utilizing computers in the calculations.

The long-term plan is distinguished by its strategic character. It expresses the conception of social, technical and economic policy in perspective. One of its most important functions is to determine the goals for social and economic development for a long period ahead to justify the aims and tasks of medium-term plans, to ensure their coordination in principle, and to achieve continuity within the framework of the economic policy. Fulfillment of this function is one of the most important and clear manifestations of the principle of centralized management of social development under socialism. The development of long-term planning strengthens the principle of centralism in planning and creates practical premises for the realization of the principle of the continuity of planning.

By its strategic, conceptual character, the long-term plan not only extends the temporal horizon of planning, but also widens (beyond the 5-year plan) the free search for economic and social solutions. It allows more possibilities for an aim-oriented (normative) approach to the formation of the lines of development and of the principle planning indicators. The strategic nature of the long-term plan and the length of the period it embraces predetermines its orientation toward major national economic problems, enhancing the role of comprehensive intersectoral issues and broadening the varieties of justification for planning decisions that practically turn into reality as the planning time period is lengthened.

For a number of reasons, all kinds of planning involve uncertainty when decisions are being made, and, in the case of long-term planning, reduction of this uncertainty acquires great importance. Preplan studies and forecasts are necessary components of the effort to reduce the uncertainty.

The long-term plan is a directive with respect to the main tasks and lines of development; principles of technical, economic, and social policy; the creation of new branches, types of production, and territorial production complexes; and achievement of a certain degree of satisfaction of fundamental social needs. Of essential significance for a long-term plan is its balanced nature both with regard to capital construction and the coordination of the major construction programs and with regard to the main factors of production (labor, sources of investment, production funds).

In order to ensure that the drawing up of long-term plans retains its importance as a source of organization and direction for the preparation of medium-term plans and in order to reduce elements of uncertainty in justifying the measures planned and in determining the lines of development, certain procedures for the improvement of the process must be provided for. The work on a long-term plan cannot be of a once-only nature; it must show a permanent, continuous character.

The general scheme of the work with regard to the long-term plan includes

Implementation of a wide complex of analytical research work and compilation of forecasts

Justification of an integrated conception of development – conceptions of development in different spheres of economic and social activity

Compilation of long-term integrated programs stating in concrete terms methods for solving key social, production, and scientific and technical tasks within the framework of economic possibilities determined in the general conception of development

Preparation of a well-developed system of indicators for the long-term plan

Coordination of the most important lines of economic policy in perspective with the socialist countries and coordination of the plans

Formulation of the next 5-year plan in accordance with the adopted conception of long-term development

Refinement of the conception and of the most important quantitative parameters of the long-term plan

The organization and the methodology of long-term planning are constructed in such a way as to ensure a leading role for the central organs of planning at all stages and in all elements of the formation of the long-term plan. An approach to formation of the long-term plan by way of a generalization and summation of elaborations for particular industrial sectors or regions is unacceptable. It is necessary to ensure, from beginning to end, the primacy of the materials that are worked out in a centralized manner and that express to the fullest extent the idea of the national economic plan.

NATIONAL ECONOMIC FORECASTING

National economic forecasting is considered an organic part of a multistage process of planning, and it requires (a) a scientific analysis of the social, economic, and scientific trends and of objective cause-and-effect relationships between social and economic phenomena under actual historical conditions; (b) an evaluation of the situation and the character of the action at hand and of changes expected in the future, foreseeing new economic situations and new problems requiring solution; (c) discovery of possible alternative strategies for the long term, including variants of a purpose-oriented economic policy, which will allow accumulation of adequate scientific material for a fully justified choice among alternatives for the development and for making optimal planning decisions.

A forecast is such an investigation of a prospective development that is not limited by economic or political decisions already adopted; it is therefore of a preliminary and variable nature. Scientific analytical data worked out at the forecasting stage serve as the basis for the next stage of the general process of national economic planning – selection of the goals of development in the course of a

definite planning period and elaboration of both an economic and a political conception of the long-term plan. The forecast can be seen as the predirective stage of the planning work. The function of a forecast is to find the fields of admissible solutions, and the function of the plan as a whole is determination of the optimal path for the achievement of the adopted economic solution.

It is accepted in the USSR that in order to create a scientific basis for planning decisions, they are to be preceded by forecasts related to science, the development of scientific and technological progress, demographic changes, natural resources, and changes in the biosphere. Forecasting of scientific and technological progress plays an extremely important role in the system of forecasts to lay down a sound basis for projecting the development of the economy of the country in the long term. Scientific and technological progress appears as the main means for solving the problems relating to the satisfaction of the needs of the society, especially if they are viewed for a sufficiently long time. Such progress contributes to the creation of the energy and raw material base of the entire national economy, to the improvement of the country's production machinery, to development of the infrastructures, and to the satisfaction of the individual and social needs of the working people. It also contributes to the improvement of methods and systems of management and national economic planning, rational use of natural resources, and protection of the environment.

Forecasts of scientific and technological progress have taken a number of directions. With a certain degree of license, they may be grouped in the following manner.

- First, the forecast of development of science and the main directions of fundamental and applied research.
- Second, forecasts of the main directions of progress in science and technology. These include forecasts relating to the introduction of new technology and new machinery across the sectors of industry and across complex directions (e.g., electrification, chemical processes, environmental protection etc.), and to particular types of production.

A forecast of the main directions of progress in science and technology describes the fundamental and essential events that may occur during the particular time interval covered by the forecast. Predicting when and how is one of the central problems of the scientific and technological forecasting.

Insofar as these forecasts are elaborated within the system of other forecasts and have as their main purpose justification of the decisions with regard to the development of science and technology, some economic evaluations of the predicted events must also be given. Absolute and specific values of various kinds of resources (especially for investments) that are necessary for realizing forecasted technological achievements must be determined. There must also be an evaluation of the economic efficiency of the results of introducing the forecasted innovation.

In working out scientific and technological forecasting for the elaboration of the

long-term national economic plan of the USSR until 1990, the following are used as indicators of efficiency.

Specific investments (the ratio between investments and the increase in production caused by these investments)

Labor intensity (expenditure of labor in average man-years or man-hours per unit of production)

Material intensity (expenditure of materials or energy per unit of production)

Expenditure of equipment per unit of production

Overall expenditures in monetary terms (present value cost)

Substantiation of these kinds of indicators of expenditure and economic effectiveness brings the scientific and technological forecast close to economic forecasting and creates important preconditions for economic projections, especially for the long term.

- Third, an important aspect of forecasting of scientific and technological progress to be further developed is determination of the social consequences of the development of science and technology.

Forecasting of scientific and technological progress must answer the question of what psychophysical demands are posed now and will be posed in the long term to man by accelerated scientific and technical progress, changes in the conditions and regimes of production and scientific activities, and the great increases in the volumes of information. It is clear that all these changes require from workers improved accuracy and responsiveness in the fulfillment of their jobs, a considerable broadening of their memory capacities, and mental stability. They call for physical and mental adaptability by an increasing number of people to quick changes in climatic conditions, time zones, new languages, and sometimes also social environment, all inevitable in the course of the widening of the social contacts and the increase in the speed of transport. Man's adaptation to the changing conditions of production and external environment is becoming the central problem.

Scientific and technological forecasts must reflect changes in the character of labor in conditions of growing automation of production. Automation liberates the worker from immediate production functions and transfers to him greater degrees of management responsibility. It leads toward an ever fuller utilization of the potentialities of man in the sphere of designing, projecting, planning, and forecasting.

Scientific and technological forecasts must contain conclusions on requirements for recruiting, rewarding, organizing, and training qualified workers, engineers, and designers. These forecasts must also fully reveal a path toward the satisfaction of the material, individual, and collective needs of the working people and toward utilization of man's leisure time.

Investigation of the prospects for the development of science and technology

is carried out by both large research organizations and temporarily established scientific and technological commissions. Temporary scientific and technical commissions are formed from among the most outstanding specialists in particular fields and also include organizers of production and representatives of the planning organs. Prospects for raising the technical level in particular sectors of industry are investigated by sectoral research and project design institutes of the various ministries and departments.

The subjects and terms of fulfillment for the investigations of scientific and technical progress are determined in the 5-year plans of scientific and technical work, which have to be approved by the State Planning Committee, the State Committee for Science and Technology, and the Presidium of the Academy of Sciences, or by special joint decisions of these organizations.

An important element in the organization of the work of forecasting is the determination of methodological requirements. Forecasts of scientific and technological progress that are based on experience gained in this field as well as on the tasks for the formation of long-term plans for the national economy must meet certain general requirements. In the forecast it is necessary:

To determine the main events that can take place during the set period of time and that can exert a substantial effect on the solution of the problem in question

To reveal the probability of the earliest and the latest times a forecast event may take place, as well as the factors and measures that may delay or speed up these times

To determine the sphere of utility of a predicted event (breakthroughs, innovations, and so on) or a complex of events in order to establish, quantitatively and qualitatively, the external links of the predicted event with other processes and systems, and their mutual influence

To anticipate possible variants and trends in the development of a process over the predicted period, depending on assumed conditions and factors and on possibilities for its practical utilization

To determine the magnitude of the material, energy, labor, financial, and other resources necessary for the implementation of the predicted event

To evaluate the results of forecasting by technical and economic indicators in order to take the content of the forecast into account in the draft of the long-term plan, as well as to coordinate and interconnect results of a given forecast with the results of other forecasts

To fix the requirements demanded from other sectors of production and knowledge in order to determine ways in which development of these sectors can ensure realization of the decisions and plans adopted with respect to a predicted event or a complex of events

To formulate recommendations concerning the most effective ways to achieve the stated aims and to produce data on the possible national economic effectiveness achievable as a result of the decisions and of the implementation of the program for which a forecast has been made

5 Planning Improvement in the Living Standards of the Population

V. F. Mayer, B. A. Raizberg,
and *V. M. Rutgaizer*

The national economic plan embraces all major problems, including those of raising material living standards. The specific role of these problems in the system of the national economic plan is defined by the fact that they represent the principal aim of the development of social production and have a determining influence on the formation of goals for the management of society in general.

National economic plans contain a broad range of indicators that, all together, characterize the multifaceted process of raising the people's well-being and encouraging all-round development of the individual. In the course of elaborating and implementing national economic plans, decisions are taken with regard to policy in such fields as the fundamental problems of labor and wages; social insurance and social security; development of culture, public education, and training of specialized manpower; health services, physical training, sports, and leisure; housing construction; communal and everyday services; development of public transport and communication; and protection of the natural environment.

In accordance with the existing system of management and planning, based on the principle of democratic centralism and requiring a combination of sectoral and territorial aspects, solutions in the field of social policy adopted at the highest level are channeled in the final reckoning to local implementers and those groups of the population whom they concern. The actions of all agencies of the general system of management are guided by the planned tasks and adopted decisions. At the same time, different agencies of the management system have a certain degree of independence in molding specific implementation decisions within the limits determined by the government plan.

WAGES AND SALARIES

The role of different levels of management and their rights are not the same in various fields of activity. For instance, decisions on the levels of wages and salaries, which constitute the basis of the organization of wages and salaries, are adopted at the level of the national economy. A great number of less significant but more concrete questions relating to the conditions of labor remuneration are solved at the intermediate levels of management. Finally, the lowest level (an enterprise or an institution) has been given the right to solve independently many problems of organization, norm setting, and remuneration of labor, including, for instance, the selection of the forms and systems of wages. At the same time, in the field of pensions, for example, norms are determined by the All-Union State Pension Law. All the practical questions regarding the granting of pensions are decided by the local social security agencies (in the administrative districts).

The social program in the 5-year plan is formulated as guidelines and general indicators. Further specification of the program is effected by adoption of various legislative acts:

Joint decisions by the Central Committee of the CPSU, the Council of Ministers of the USSR, and the All-Union Council of Trade Unions

Decrees of the Council of Ministers of the USSR

Decrees of the Presidium of the Supreme Soviet of the USSR, which then are formally passed as laws by the Supreme Soviet

Help in preparing these legislative acts is usually given by such bodies as the State Planning Committee of the USSR (Gosplan), the State Committee of the Council of Ministers of the USSR for Labor and Social Issues (Goskomtrud), the Ministry of Finance of the USSR, and the All-Union Council of Trade Unions (VTsSPS), as well as the directly concerned ministries and departments, governments of the union republics, and central committees of individual trade unions.

During the preparation of the draft plan, certain procedures for implementation of decisions concerning the raising of income and consumption are provided for. For instance, the part of the increase in the wages fund in the national economy that ensures an increase in the number of industrial and office workers and up to half of the increase in the fund that ensures an increase in the average level of wages is distributed in the 5-year plan from the national level to recipients such as the central ministries and departments and the governments of the union republics. These, in turn, in the final implementation, assign increases to enterprises and other organizations.

The part of the increment in the wages fund intended to ensure an increase in average level of wages remains in the reserve. It is used to implement specific measures with respect to wages and salaries that have been outlined by the social program of the 5-year plan.

Among major measures with respect to the raising of the wages and salaries that have already been implemented or are being carried out at the present time, one should note the raising of the minimum wage and the introduction of much higher wages and salaries for industrial and office workers.

The procedure for preparing, coordinating, and adopting the decisions on the basis of which the above-mentioned measures are implemented is approximately as follows.

The State Committee of the Council of Ministers of the USSR for Labor and Social Issues (Goskomtrud) uses research carried out by scientific organizations and proposals from both a number of ministries and some of the biggest enterprises to work out a draft proposal for the system of wages and salaries, related to the new minimum wages, for the entire national economy. This draft project is agreed upon in its general outlines with the All-Union Central Council of Trade Unions, the State Planning Committee, and the Ministry of Finance. Afterwards, elaboration of all the other elements of the future system for structuring wages and salaries in the national economy begins under the guidance of the Goskomtrud.

When the time for the introduction of new pay rates for a group of industrial and office workers, fixed by the 5-year plan, approaches, the Goskomtrud prepares a draft legislative act, and, after preliminary coordination with the interested parties, this draft law is submitted for consideration by the government. This is considered by the government after it receives official responses from the interested central ministries and departments and the governments of the union republics.

Only the most fundamental issues in the sphere of wages and salaries, including the approval of wage and salary rates, which constitute the basic structure of the system, are solved by the decisions of the supreme bodies. Less important questions requiring a decision in a centralized manner are decided upon by the Goskomtrud jointly with the Presidium or the Secretariat of the VTsSPS or by the Goskomtrud together with the interested ministry and the central committee of the particular trade union.

A number of questions regarding wages and salaries are decided locally by the management of economic amalgamations or of the enterprises and institutions, but always jointly with the appropriate trade union organs. Decisions taken in decentralized fashion are implemented either in accordance with typical recommendations by superior state and trade union bodies or in a completely independent way.

Thus, for example, the management of enterprises, in working out the regulations for giving bonuses to engineers, technicians and office workers, agrees upon their content, indicators, conditions, and bonus rates with the trade union organizations.

Within this system, the main problems are to be solved at the highest level of management of the national economy, while other problems, depending on their importance or on the degree of detail necessary, are resolved at lower levels. This allows implementation of the unified wage and salary policy, ensuring adequate flexibility in the system and consideration of specific, local conditions. In the final

analysis, it helps to ensure a single measure for the remuneration of labor across the entire national economy.

When a decision is taken at the highest level, say, about raising the wage and salary rates for a specific group of workers, additional funds are set aside from the funds reserved beforehand in the national economic plan for the appropriate ministries and departments and the governments of the union republics. Thus in 1971, the average wages and salaries of railroad workers were raised by about 20 percent; and in 1972, those of doctors, teachers, and educational staff at preschool establishments by over 20 percent. As a result of the introduction of new wage and salary rates in the production sectors of the national economy in 1973–1975, average wages in the coal-mining, petroleum, and gas industries, metallurgy, electric power industry, and machine-building were increased by 10–11 percent; in the oil and chemical industry, by 13–14 percent; in light industry and the food industry, by 14–16 percent; and in agriculture, water conservation, and the timber industry, by 14 percent.

The tenth 5-year plan for 1976–1980 provides new measures for increasing the income of the population, raising wages and salaries, raising the pay of collective farmers, and increasing pensions. At the same time, the state retail prices are to remain stable.

PENSIONS

In 1971, the minimum old age pensions were increased in the Soviet Union both for industrial and office workers and for collective farmers. The average levels of old age pensions for the collective farm peasantry were also increased to bring them into line with pensions for industrial and office workers. Improvements in pensions were made by adoption of a Decree of the Presidium of the Supreme Soviet of the USSR, which was then approved by the Plenary Meeting of the Supreme Soviet of the USSR and thus became law. Towards the end of 1973, similar legislative acts about an improvement in pensions for invalids and for families that have lost their breadwinners were adopted.

As in the case of wages and salaries, principal decisions about improving pension provisions, in particular about raising the minimum old age pensions, were adopted by the 24th Congress of the CPSU and were then fixed in the ninth 5-year plan. Means for increasing the pension fund were included in the national economic plan for the appropriate years of the 5-year plan period.

EDUCATION

An important component in planning the living standard of the population is education, which must satisfy man's need for knowledge. Planning must deal with

the duration of education as well as with its types and forms. The system of education includes

General secondary education, vocational–technical education, specialized secondary education, higher education
Full-time and part-time education (day and evening)
Studies in the humanities, in social studies, in technology, in science, and in mathematics

In the USSR general secondary education has been introduced. The nature and volume of the knowledge needed, however, are bound to change on this level of education. What we have in mind, above all, is strengthening the humanities and introducing those methods of learning and teaching the natural and physical sciences that are now typical of higher education.

Vocational–technical and specialized secondary education, while satisfying the need of the population for secondary education, must also take into account the demand in the national economy for specialists in a given field and the required level of training. At the same time, the number of students in various educational categories must correspond to the distribution in the working population according to the types of occupation. This means that the framework for the broadening of specialized education is limited by the long-term needs for manpower resources for various sectors of the national economy.

Higher education occupies a special position. Its development is determined by at least three goals:

Satisfaction of personal demand for higher education
Satisfaction of the national economy's demands for specialists
Progress in science and scientific research

Now and in the foreseeable future, priority must be given to the needs of the national economy for specialists with higher education.

The dynamism of scholarly research creates a need for constant renewal of knowledge. This implies responsibility for systematic elevation of the qualifications of specialists based on their previous education, requalifying them in midcareer with or without taking them off the job. Courses designed for elevation of qualifications have evolved into a system of institutes for continuing education. These have as strong an educational basis as specialized secondary institutions and institutions of higher learning.

HEALTH SERVICES

The task of planning in the field of public health is to create necessary health services, whose extent is usually determined by the material, financial, and labor

expenses involved. Indicators for the development of public health services consist of the following:

Number of hospital beds and number of physicians and medical personnel for each 1,000 people

Turnover capacity of ambulatory care facilities

Production of medicine and drugs

Supply of medical institutions with medical equipment and means of emergency assistance

Cost per patient for hospital service

There are, of course, more objective indicators for levels of health achieved and the record of prevention. Such indicators are the frequency of illness, the average duration of illness, the number of fatalities, and the number of working hours lost because of illness.

These "primary" indicators, however, cannot be used as goal indicators since they concentrate on measures of health deficiency. The "secondary" indicators reflect means for overcoming these deficiencies. Perhaps the truest indicator of quality of the health care system is average life span. It is, however, insufficiently representative of the range of things that health services must cover.

In agreement with these considerations, the formulation of goal-oriented tasks for public health services begins with forecasts of the rates of illness in the population. The data from such forecasts, together with forecasts on methods of treatment that represent the standard for the needed health service, serve as a basis for determining the general scope of health services needed. Thus, for example, the long-term estimate of the need of the population for hospitalization indicates that the number of hospital beds must reach 14–15 for each 1,000 of population.

Public health goals are examined not only from the viewpoint of the full availability of medical services, but also from the viewpoint of their interrelationship. Thus, the more that is done in diagnostic and ambulatory care services, the less may be required in hospital services.

Naturally, individual tasks in public health development merge with some tasks in development of other service branches. The preparation of physicians and of medical personnel includes tasks in both public health and education.

HOUSING

National tasks concerning the development of housing concentrate on satisfying the need for comfortable living quarters. These targets can be represented by rational standards for providing the population with housing. Such norms depend in many respects on the subdivision of the population into family units; since the structure of the population changes over time, the standards must also vary. In addition, the

standard of average living space per person is conditioned by historically established lifestyles and opportunities as well as by comparison with levels reached in other countries. Variations in standards reflecting changes in overall demand for living quarters are also caused by transformation of regional population structures, by tendencies to urbanize, and by long-term changes in the size and age composition of the average family.

Determination of housing needs and consequently of the goals of housing system development cannot be isolated from the needs for public utilities, which constitute another aspect of the same problem. Thus, a systems approach to planning housing and community services should be based on a unified concept of the housing complex, covering the whole range of requirements connected with proper housing conditions. The goals of development of these vital services are interrelated with the objectives of scientific and technological progress aimed at bettering living conditions and at improving and increasing housing construction.

NONPRODUCTION SPHERE

The planning of the nonproduction sphere of the economy, as well as of other branches of industry, consists of balancing the population's needs and the capacity to meet them, considering primarily the actual resources of society (labor, material, and financial).

When planning labor costs, one must keep in mind that meeting the growing demand of society for the services of the nonproduction sphere requires a still greater growth rate of employment in this area. However, the opportunities for economizing on labor are more limited here than in material production. In material production the same economic result can generally be achieved with various combinations of manpower and fixed assets, depending on the degree of their interchangeability. But in most of the nonproduction sector, the number of resource combinations necessary to achieve the fixed end result is far smaller because of the poor interchangeability of manpower and fixed assets.

Since the manpower resources of society are at any given moment limited, the demand for labor in the service sector must be coordinated with the total planning of manpower and its sex and age distribution among the sectors of the national economy.

The expansion of the service sector, the increase in resources consumed by this sector, and its greater role in solving the long-term socioeconomic problems determine the necessity of long-term service development planning. According to the general procedure of elaborating the long-term national economic plan, long-term planning for the service sector, as well as for the nonproduction sphere as a whole, begins with formulation of a plan conception. The conception includes the main ways and means of solving the major problems, improving the material and technical basis, and managing the nonproduction sectors of the national economy.

Of great importance for formulating the conception is a set of forecasts that outline prospects for further development of nonproduction sectors and lay down the scientific basis for preplan studies. The forecasts constitute an interrelated system embracing goals, tasks, and resources needed to meet the goals. Based upon forecasts and tasks and approaches to solution of these tasks, the procedure for working out the conception in detail is defined.

The major long-term socioeconomic tasks solved by the nonproduction sectors serve as inputs for working out the concept. Growth rates and proportions for the nonproduction sectors as well as resources are defined by aggregated balances covering the key economic indicators.

In working out the concept, one analyzes different task alternatives and the resources they would require. The concept serves as the basis for the formation of the draft long-term plan for service sector development.

Planning for the service sector provides for overall evaluation of the necessary resources that should be considered in estimating the resources required for the production sectors of the national economy. The long-term plan presents all-round production evaluation of individual branches and the entire service sector. For this reason, besides evaluation of the resources required, integrated indicators for service output are developed.

6 Organization of Social Planning

V. G. Afanasyev

In the USSR at present the thesis is gaining ever wider acceptance that the law of planned and proportional development is not only an economic law but also a sociological one. Planning has not only economic but also social dimensions. The objective processes taking place in socialist society, the rich experience of planning in the USSR and in the other socialist countries, as well as theoretical investigations, testify convincingly that socialism's economic base – that is, social property – creates the possibility of and necessity for planned and purposeful development not only of the economy but also of all other spheres of the society's life, including social and other nonmaterial relations.

Planning cannot be purely economic, in general. This is true above all because economic relations, while constituting the basis of all other relations, are influenced by the latter. In particular the economy is influenced by politics and class relations, for, after all, economic development in class society is always realized in the interests of certain classes. It always has a definite class purpose. Production has a distinct social and class orientation. The aim and social orientation of socialist production is not the achievement of maximum profit but satisfaction of the constantly growing material and nonmaterial requirements of the working people. Hence the need for a political, class approach to the solution of economic problems.

Apart from that, development of the economy is realized by definite social collectives (classes, the team of workers at the enterprise, production amalgamation, and so on) under definite social conditions and with definite social consequences. Hence planning must take into account these circumstances and consider how economic changes influence the destinies of classes, nations, and social groups, and the relations between them.

Tremendous experience has been accumulated in economic planning – in the planning of the development of the national economy. An appropriate methodology has been worked out, and these methods and techniques are constantly being

improved. The object of economic planning has been determined sufficiently precisely: the national economy with its sectors, production amalgamations, and enterprises.

Social planning is a much more difficult matter. Here we meet with difficulties of a methodological nature, and first of all with difficulties of determining the object of planning. Planning requires certain knowledge about the object of planning. It is unquestionable that social relations are the object of social management and planning and that social planning is a system of measures directed to achieving optimal functioning and development of the structure of society, to achieving social homogeneity. But what are social relations? This question can hardly be answered briefly, since social relations are of multileveled character.

The first and the broadest aspect of social relations covers the entire system of social relations: economic, sociopolitical, cultural, family life. In general terms, social relations are relations of people in collectives, relations between collectives, relations between a person and a collective. These are relations that form on the basis of the location and functions of a given collective in the social system (and its subsystems). However, collectives are of different orders: they differ, for example, in their intrinsic properties, their role in society, and the number of people comprising them. All of this testifies to the existence of different levels of social relations.

One of these levels involves relations between large social groups: nations, classes, city and countryside, groups of people who perform intellectual and physical labor, different generations, and so on. The core of social relations on this level is the relations between classes based on production (economic) relations.

There is another level of social relations – a lower, more elementary one – the relations between people in the working collectives. It is characteristic that on this level people belonging to different classes and social groups, nations and nationalities, different generations, and people living in cities and in the countryside are in mutual interaction. The labor collective represents a cell of society, a kind of node of social relations.

The collective is a group of people connected by a common aim. They have a single organization structure, a sense of discipline and responsibility, a single ideology. They work together in the interests of society. Two types of collectives are distinguished: the primary collective to which teams of workers, sections, shops, and similar small groups belong, and the main labor collective (e.g., enterprises, establishments). In the primary collective, people are in direct contact with one another in systematic ways. In the main collective, on the other hand, direct contacts are not necessary, and, as a rule, they do not occur. An exception is small labor collectives that are at the same time both primary and main.

Thus, we have essentially three levels of social relations that are objects of social planning. Social planning covers the system of social relations as a whole, which includes economic, sociopolitical, nonmaterial, and everyday family aspects of life. Planning also covers relations between and within classes, between and within

nations, and between and within social groups and collectives. Relations that develop among people in labor collectives are also the subject of social planning.

"Social" for us means "belonging to the collective." Therefore, social planning looks at relations between collectives (in the widest sense of the word) and within collectives. Because social collectives range in nature from society as a whole to the labor collective or family, one may speak about various levels of social planning.

The highest and most general level is the planning of the development of social relations within the society as a whole. Planning on this level is done by the party and the state. The development of social relations here is incorporated in plans for the development of the national economy. These plans reflect the main lines of economic development, the entire system of social relations (relations between the working class and collective farm peasantry, between people who perform mental and physical labor, between nations, and so on). The general goal that is the substance of social policy is to ensure a successful movement of Soviet society from class differentiation to *social homogeneity*.

Experience in planning in the USSR and other socialist countries shows that, first, national economic plans, besides using economic indicators, also incorporate indicators that characterize the proposed development of nonproduction spheres: science, culture, education, trade, community and medical services, and the like. Second, our plans aim at the achievement of such goals as

Ensuring, on the basis of economic development, increased growth rates of the people's well-being

Ensuring further progress toward eliminating great social differences between city and village, between those who perform mental and physical labor

Further strengthening the fraternal unity of the peoples of the USSR

Strengthening and developing the unity of working class, peasantry, and intellectuals

These are the social tasks set forth in the tenth 5-year plan.

The all-union plans of economic and social development are shaped both along territorial lines (e.g., republics, economic regions, territories) and along the lines of economic sectors (industry, agriculture, transport, communications, culture, and their numerous subdivisions). This planning is completed at the level of the various individual enterprises in different fields (industry, agriculture, culture, and so on).

Enterprises and labor collectives constitute the fundamental unit of the economy, of sociopolitical and nonmaterial life. They are the economic and social cells of the socialist society. The labor collective is, in miniature, a copy of society; in it both the relations of concord and mutual assistance of people, characteristic of socialism, and managerial relations are realized. Relations of people in labor collectives occupy an important place in the entire system of socialist social relations. Through these social ties a collective is "inscribed" into the entirety of relations of a society.

It is known that the social qualities of man are influenced by the social environment. However, the influence on a particular individual is realized indirectly – through the "micromedium," his immediate environment. Among the elements of "microenvironment" (e.g., labor collective, school, family, street), the labor collective occupies a most important place. If the microenvironment and, above all, the labor environment works in the same way as the general social environment, the individual assimilates the particular features of the latter. He becomes its carrier, partisan, and defender. In the opposite case, if for any reason (lack of order, lack of organization, selfish motivations, immoral conduct, for example) the labor collective works in a direction that does not coincide with the effect of the general environment, it shapes features of the individual that do not correspond to the requirements of society.

As a matter of fact, nothing has such a detrimental effect on the thoughts and actions of a person as subjectivism, bureaucratic rigidities, bungling by individual functionaries, or absence of order and organization. By the same token, it is hardly possible to overestimate the beneficial effect of organized and scientifically justified ways of handling matters in all the sectors of the economy and social life. They help to form in a person a firm, sober, and thoughtful view of reality; calmness and confidence; and a heightened sense of responsibility. They stimulate him to fresh creative accomplishments.

The task of planning and managing social life and developing the labor collective is to have each member of the collective, the collective as a whole, assimilate those qualities that meet social requirements and favor the attainment of the aims of the society as a whole.

Primary collectives of an enterprise – production brigades, groups of specialists, and the like – play a considerable role in resolving this task. In these collectives an individual realizes his direct contacts with his comrades in labor. He "joins" in the social structure of the enterprise and, through it, in the system of social relations of the entire society. In the primary collective, one finds established not only formal relations determined by official position, but also informal relations caused by general traits of character, common likes, and personal sympathies. Formal and informal leaders emerge here. The former exert an influence on the collective due to their leading positions; the latter, thanks to their authoritativeness and attractive personal qualities. This variety of relations in a primary collective must not be left out of consideration when social development of a labor collective is planned.

A labor collective is an aggregate of people of different ages and nationality, qualifications, habits, temperament, and interests. To create out of this aggregate a united harmonious whole, to assign people in such a way as to enable them to contribute most for the good of a cause, to give them an opportunity to manifest and improve their abilities more fully, to organize their effective cooperation, to create an atmosphere of mutual trust and reliability and a possibility for free exchange of ideas and experience – such are the tasks of social planning and management of a collective.

In socialist society and socialist collectives, truly human relations – relations of concord and mutual assistance of people free from exploitation – have come into being. Such concord does not mean absence of conflicts, though conflicts are of nonantagonistic forms. Occasionally, however, relations between people acquire a dramatic character. They can cause psychological traumas, neuroses, and psychoses – all having a negative effect on the work of a collective. It is natural, therefore, that the task of leadership in a collective is to uncover conflicts and to overcome them in time. For this purpose, it is necessary above all to know the causes of conflict. These causes can be connected with

The process of labor (incapacity or inability to carry out the work entrusted, lack of satisfaction with the work or with the conditions of labor)

Inability to establish normal relations with colleagues or manager (owing to the quarrelsome character of the worker or to the roughness or arbitrariness of the manager)

Shortages of material comforts (wages, housing)

Personal problems (family troubles, tragedies, failures), which are transferred to the collective and to the relations with the surrounding people

There are no simple cures for such conflicts. Everything depends on the nature of the conflicts and their intensity, on the numbers and personal qualities of people involved in them, and on the conditions in which they take place. Serious efforts by the entire collective, and above all by its managers and by the Party, the trade union, and the Young Communist League (Komsomol) organizations are necessary to resolve conflicts.

In the mid-1960s, in the USSR, we began to elaborate plans for the social development of labor collectives. The first such plans were worked out at the Leningrad "Svetlana" Amalgamation and some other Leningrad enterprises. The initiative of the Leningraders has been approved by the 23rd Congress of the CPSU, and at the 24th Congress wide expansion of the practice of social planning was noted.

Under the present economic conditions, the collective of an enterprise not only has broad democratic rights, but also has material means for their realization. The funds earned as a result of efficient conduct of its affairs – funds for the development of production, for incentives, for social and cultural measures, and for housing construction – are put at its direct disposal. Each member of the collective has been given opportunities for active participation in management, for exerting an influence on the solution of issues of the economic, social, and nonmaterial life of the collective, and through these, of society as a whole.

These rights of the members of the collective as well as the rights of the collective as a whole are secured by the new Constitution of the USSR, adopted in 1977. It proclaims that labor collectives participate in the discussions of state and public affairs, management of enterprises and institutions, issues of production

planning, organization of social competition, the extension of effective methods of labor, strengthening labor discipline, improving the conditions of work and life, the utilization of funds assigned for the development and production and also for social and cultural measures, and material incentives. The labor collectives bring up their members in the spirit of Communist morals and high political consciousness, taking into account their cultural and professional level.

Production and the entire life of society have become so complex, the number of components of the social system at any level so great, that it is simply impossible to make correct decisions on individual small issues from a single center, however competent it might be. Hence, while strengthening and developing the centralized management of socialist society, we have seen a trend toward some redistribution of individual managerial functions, including the functions of decision making, "from the top toward the bottom."

Of course, this does not mean any weakening of, nor retreat from, centralized planning and management. There is not even the slightest infringement on the principle of democratic centralism. What is meant is the involvement of new masses of working people in the management of production, in the management of social affairs. This process finds its expression in strengthening of the role of the soviets, of social organizations, and, especially, of labor collectives, in the life and development of Soviet society.

Both social and economic planning presuppose a scientific determination of goals as well as of the basic ways and means for their practical attainment in the interests of all the working people. At the same time, one must keep in mind that social planning cannot be as rigidly determined as, for example, technical and economic planning. This is due to the unusual flexibility, mobility, and multilayered nature of social relations. In the social field it is often difficult to establish precise terms and rates of various transformations or to express planned measures satisfactorily by means of quantitative indicators. However, along with the improvement of the practice of planning and the growing utilization of computing and mathematical methods in sociology, the number of quantitative indices contained in social plans is expanding.

At the practical level, a question is often raised about optimizing the plans for social development. In the most general form, an optimum is achievement of a goal within the shortest possible time at minimum expenditure. This kind of an optimum can be indisputably found in tasks of a technical and economic nature. In solving the problems of a social character, on the other hand, application of this criterion of optimization sometimes leads to serious difficulties and mistakes.

In general, while economic effectiveness is an important component of social effectiveness, the two are not identical. Social effectiveness of a planning measure is a very complicated phenomenon. From the social point of view, a measure is effective if it contributes to the rational functioning and development of socialism as a social system, to the general solution of complex problems facing society, and to society's successful advance towards Communism. It is important not to

make economic effectiveness a goal in itself, but, as far as possible, to forecast and plan the social and ideological consequences of even the most appealing and effective economic measures.

Social effectiveness in Soviet society is, above all, orientation of decisions toward people. It is the degree of service rendered by the economy to the social and nonmaterial life of man, to the cause of his all-round development.

In analyzing the available experience, it can be noted that the plans for the social development of enterprises contain four main groups of measures.

The first group includes *measures for the transformation of the social structure of the collective.* It encompasses all measures for forecasting the social–demographic structure of the collective and for raising the educational level and qualifications of workers within an enterprise and determining their distribution. The most important of these measures takes into account social consequences of the scientific–technological revolution. It is well known that nowadays the efforts of collectives in enterprises are directed toward increasing the efficiency of production by application of the most recent achievements of science and technology. These achievements, however, introduce profound changes into the work and life of a collective, raising demands with respect to the level of culture and professional training of employees and calling new vocations into existence and rendering old ones obsolete. This means that the plans have to envisage measures for raising the cultural and technical level of workers and for training specialists.

Scientific and technological progress, mechanization, and particularly automation release many people from their previous duties. Hence, it is important to foresee the dynamics affecting manpower at enterprises during the planned period: how many and what workers will be released from work, when and for which jobs, how many have to be retrained, how many have to be transferred.

An important place in social planning is occupied by measures for reducing turnover of personnel. This again is tied up with scientific and technical progress, because only permanent cadres can master complex modern machinery and technology. Of course, there are general causes of mobility and turnover that do not depend on the given enterprise (differences in wage and salary rates of workers and specialists, in the level of housing availability, in the availability of other everyday facilities, for example). Much depends, however, on the collectives at the enterprises. For example, at the Leningrad "Svetlana" Amalgamation, it has been found that of the total number of women assembly workers who were dissatisfied with their work, 21 percent named poor relations with management as the reason. Another 48 percent named poor relations with colleagues, and 20 percent, poor relations with the quality control worker.

In this case, the conflicts were studied in detail, as were relations of all kinds between people in the collective. Appropriate redistributions were made, and educational and organizational measures were taken. This has made it possible to make the "social climate" in the collective more healthy. As a result, mobility at the "Svetlana" Amalgamation has fallen to a rate three times lower than the average mobility throughout Leningrad.

An enterprise can significantly cut down the mobility of manpower by means of skillful application of the measures stated, as well as by a system of material and moral stimulation, by providing housing and other advantages, and by giving vacations depending on the length of service.

The second group are *measures with regard to the scientific organization of labor*. Sometimes scientific organization of labor is understood as a purely technical problem and is reduced to some aggregate of organizational and technical measures. In fact, the scientific organization of labor is an important social problem, for what it is all about is how to organize work, people, and social collectives in the most rational way. It involves not only how to raise the productivity of labor but also, above all, how to construct a system of interaction between man and machine and between man and the overall production environment in such a way as to eliminate the deleterious effects of technology and environment. It involves increasing an individual's interest in his work, making it as creative and attractive as possible, as well as eliminating heavy, monotonous, and tiring work so that work becomes a means for improving physical and intellectual capabilities.

The third group are the *measures for improving the well-being of the working people – improvement of housing and cultural opportunities*. In this group are measures for improving wages and salaries as the principal way of increasing the real income of working people. In planning these measures, it is important to take into account all the factors influencing the level of wages: qualifications and education, fulfillment of production norms or tasks, conditions of work and the system for remuneration, and the size of incentive funds and the system for their distribution. Of great importance is the improvement of the system for material and moral stimulation of labor.

This division of the plan also reflects issues of improvement of housing, cultural and everyday services, public dining facilities, and facilities for leisure activities and recreation.

The fourth group are *measures connected with the Communist upbringing of the working people, with the development of their social activities, development of socialist democracy, and involvement of all the members of the collective in the management of production and in social life*. This includes such activities as the work of permanently functioning production conferences, economic analysis bureaus, design and technological offices formed on a voluntary basis, and scientific and technical societies, as well as questions of socialist competition. In a great number of enterprises the program of social development has become an organic part of the production plan.

The advantage of a general social–production plan is its great stimulating force, because the magnitude of the means set aside for social development derives directly from the efficiency of production. As a result, both production and the cause of social development show a gain.

The first to elaborate an integrated social–production plan was the chemical plant named after the October Revolution in the city of Rostov-on-the-Don. This

plan was worked out through the joint efforts of management and the working people of the enterprise. To collect proposals and to work out measures, permanent working commissions were set up in the shops. Representatives of management, as well as of the Party, Komsomol, and trade union organizations, are members of these commissions, as are leading members of the production force. Measures selected by the commission are discussed and made more precise at general meetings of workers and shop specialists. Afterwards, these measures are sent to plant management and to factory social organizations where they are studied, agreed upon, and coordinated. The plant economics research group checks their effectiveness and draws up a draft integrated plan for raising the efficiency of production and promoting social development of the collective. The draft is considered by a special plant commission and is approved by the plant director and the chairman of the plant trade union committee. As can be seen, the integrated social–production plan is a result of the work of the entire collective of the enterprise.

Under the integrated plan, the Plant of the October Revolution has attained good results in both economic and social development. Each year 750–800 people improve their qualifications, and over 200 production workers study at higher educational establishments, technical schools, and evening schools. Over 1,000 people take part in creative associations (voluntary institutes of worker–researchers, design offices, complex groups of specialists and workers, and so on). Everyday amenities and cultural conditions in the life of the working people have improved considerably. The plant has built a recreation center on the banks of the Don and a holiday hotel on the Black Sea.

This democratic system for elaborating plans of social development, similar to the system that has come into being at the October Revolution Plant, but with appropriate modifications, is functioning now in all the other enterprises of the USSR. Scientists, sociologists, psychologists, and philosophers take an active part in the elaboration of these plans.

A particularly important role in social planning belongs to the trade union organizations, which V. I. Lenin characterized as a school of economic management. In September 1971, the Presidium of the Supreme Soviet of the USSR approved a new "Regulation about the rights of the factory, plant, and local committee of a trade union." The trade union committees, the regulation notes, ensure the participation of all the employees of the enterprise in the management of production through general meetings, production conferences, and different forms of voluntary social activities. At the same time, the administration of enterprises and other kinds of organizations is obliged to create conditions ensuring participation of workers and employees in the management of production. It is the duty of officials of the enterprises and other organizations to consider, in timely fashion, critical remarks and proposals by the employees and to inform them about the measures taken. The factory, plant, and local trade union committees take part in elaborating draft production plans and draft plans for the introduction of new technology, for capital construction and for construction and

repair of dwelling houses, for cultural and everyday services, and for social development of the collective.

One of the effective forms of participation of the workers and employees in social planning and management is permanently functioning production consultation conferences at each enterprise. Their main object is to raise the efficiency of production.

At present, in the Soviet Union, there are about 200,000 permanently functioning production conferences with over 6 million elected members, of whom workers make up the majority. By the decision of the Council of Ministries of the USSR and the All-Union Central Trade Union Council dated June 18, 1973, a regulation on these permanently functioning production conferences was approved, considerably broadening the rights of these conferences. The work of such a conference embraces an extraordinarily wide range of problems – from participation in the elaboration, discussion, and fulfillment of the current and long-range plans of an enterprise to the culture and everyday life of the working people.

It is well known that the solution of many problems of the social development of labor collectives transcends the limits of enterprises or amalgamations. Hence, there is a need for combining and supplementing the plans of social development of production collectives with social plans of regions (cities and the like). In coordinating the plans of the collectives, the regional plan is not simply a sum of these plans, but a qualitatively new plan reflecting specifics for the development of the regional system – a system of a higher order than that of a particular enterprise. This system fulfills specific socioeconomic, sociopolitical, cultural–educational, and economic functions* that must be reflected in a regional plan.

In the long run, social measures planned on the scale of enterprises, cities, districts, regions, and republics should become components of a single plan for the socioeconomic development of the entire Soviet society.

* See Problemy sotsial'nogo razvitiya [Problems of social development]. Moscow: Mysl' Press, 1974, pp. 183–184.

7 The Scientific–Technological Revolution and Some Current Problems of Scientific and Technological Policy

J. M. Gvishiani

SOME CHARACTERISTICS AND PROBLEMS OF THE SCIENTIFIC AND TECHNOLOGICAL REVOLUTION

In speaking about the essence of an extremely complex and multifaceted process encompassing the entire world – the scientific and technological revolution – it must first of all be emphasized that the revolution signifies a qualitative transformation of the productive forces in contemporary society on the basis of the transformation of science into a direct productive force. This, in turn, has brought a revolutionary change in the material and technical base of social production, in the character of labor, in the structure of the productive forces, and in the social division of labor. These factors have an effect on all aspects of life – including everyday life, culture, and the psychology of the people. In exerting an increasing influence on the social and economic development of society, the scientific and technological revolution is itself conditioned by the level of this development. This revolution has become possible only because of a high level of socialization of production.

The scientific and technological revolution is not limited to great discoveries or events. It encompasses the reconstruction of the entire basis of production, starting from the utilization of materials and energy processes and ending with machine systems and methods of organization and management and new definitions of the place and role of man in production. The scientific and technological revolution creates preconditions for combining into one system the most important forms of human activity: science – the study of the laws of the development of nature and society; technology – the complex of material means for transforming nature and the experience gained in such transformation; production – the process of creating material goods; management – methods of rational interrelations between purposeful practical actions in fulfilling production and other tasks. Formation of this unity leads to far-reaching consequences for each of its components.

In science, interaction between its branches begins to play a leading role, and, what is particularly noteworthy, the role of the social sciences in the solution of practical problems is growing. From the socioeconomic viewpoint, the main thing is that the unity of scientific inquiry and the productive activity of man becomes a powerful force for the development of production.

In technology, thanks to the strengthening of ties with science, the creation of new tools and means of labor and the appearance of new kinds of technology acquire primary importance. This is manifested particularly clearly in the approaches to the utilization of natural resources. For many centuries mankind acted on the assumption that natural resources were inexhaustible, thereby exerting an effect on nature whose scale today approaches that of geological upheavals. Technology could be "tuned," so to speak, only toward consumption, concentrating some substances and dispersing others. Today, such an approach is shown to be unjustified and wasteful, both in view of the limited resources and as a result of the negative consequences of the "dispersing" activity of man, leading to dangerous pollution and poisoning of the environment. Here, an exceptionally important role belongs to wasteless technology, which is becoming one of the most important practical measures to protect the environment and to ensure recirculation of natural resources so that the materials going into production and circulation are not lost but are used many times.

In production, the role of man as worker is undergoing a radical change as a result of integrated automation of production and management and the creation of technical means fulfilling not only mechanical but also logical functions. The most important social effect of these changes is that conditions are being formed for overcoming essential differences between intellectual and physical labor, between labor in industry and in agriculture, between city and countryside, and between the production and nonproduction spheres.

Nowadays, it is not enough to discuss problems of the scientific and technological revolution merely in terms of its "social consequences." The development of science and technology should be considered not simply as a leap in the development of productive forces of society, but as a specific social process that not only has an effect on other elements of the social organism but, to a certain extent, directly shapes them. Thus, the scientific and technological revolution arises before us as a practical realization of the social and cultural potential of science and technology, as an embodiment of their sociocultural transforming force. For social interrelations in society – their rational, objectivized elements – are being strengthened. Not only human intercourse but the character of the management of production and society is undergoing a change along these lines as well.

No less significantly, the scientific and technological revolution influences the relationship between man and nature. Along with the realization that we cannot continue to infringe on the ecological balance, we are experiencing a radical alteration of the very nature of this environment, including such fundamentally new elements as, for instance, outer space or the seabed.

By transforming culture – the relationships of people with one another and with nature – the scientific and technological revolution changes man himself, although not as directly and radically as is asserted by some overemotional critics of "technical civilization."

Considering the scientific and technological revolution as a specific sociocultural process, we come to the conclusion that to evaluate it in categories of "optimism–pessimism" alone is insufficient. For what it is all about is no longer what "the revolution will give man," but to some extent "what it will make of him," what kind of culture, lifestyle, style of intercourse and interaction with nature it will shape. And, in this respect, one must not be limited to making prophecies or describing utopias. It is a vital task for man not only to forecast trends and consequences, but also to manage them, by implementation of a scientific and technological policy. This presupposes solution of a whole series of complicated and varied problems, including sociological ones. The basic and, in our view, the most difficult one consists in determining the range of possibilities of controlling the scientific and technological revolution. Above all, we have to answer the question of whether it is possible to overcome the limits that objective (cultural, economic, political) social processes pose to a purposeful control of this revolution in the interests of man, and to what extent.

Is it possible that the management of the scientific and technological revolution is really limited to correction of its undesirable consequences? Is the idea about alternatives for the development of science and technology merely a myth? If so, any discussion about a scientific and technological policy becomes empty talk and wishful thinking.

The true limit to controllability lies within science and technology itself, and it is determined by the immanent logic of their development. If this logic constitutes an objective, unambiguously determined sequence of scientific discoveries and technical inventions, then one can speak only very conditionally about a scientific and technological policy as a target-setting choice. It becomes in this case a policy of foresight and avoidance, not a policy of decision making in the exact sense of this term.

Today, in our opinion, a number of basic social preconditions that are necessary for the discovery and utilization of alternative paths of development of science and technology are being formed. Among them is first, the growth of the importance of science itself as a social institution. The extraordinary growth of its technical and economic arsenal, its trained cadres, and the purposeful organization of scientific efforts permit one to assert that modern science can accomplish what "classic" science could not afford to do. It can simultaneously develop alternative scientific and technological paradigms, realize different scientific approaches, check on the social consequences of each of them, and then select the one that is closest to the humanistic values of our contemporary era.

Second, ever more often, society is making unambiguous social demands with regard to the development of science and technology. Today, this is manifested by

negative and vague forms of condemnation of or disenchantment with the social results of modern scientific and technological development (economic crisis, energy crisis, and so on) and by statements to the effect that modern science marches "in the wrong direction." However, tomorrow these demands can (and must) be formulated more precisely as new social criteria and cultural norms, within whose framwork science and technology will develop.

Third, opportunities for a rational and humanistic policy in the field of science and technology are increasing because the developed countries can afford, less than ever before, to use purely economic criteria for evaluation of scientific and technological applications. This gradual liberation from rigid economic rationality is already taking place in the socialist countries, where any technical innovation is considered first from the positions of the immediate interests of the people, and only afterwards from the point of view of economic profitability. A shift of mass consciousness in this direction may also be observed in the Western world, where a purely utilitarian approach to science is being subjected to ever more profound criticism. It is obvious that, having embraced the possibility of choosing not necessarily "the most profitable" science and technology, mankind has radically expanded the boundaries of their possible applications.

And, finally, the fourth, purely sociological aspect. It is quite clear that not only scientific, economic, and social preconditions are necessary for the implementation of a policy in science and technology but cultural preconditions as well. They emerge in modern society on different cultural levels. Ever more profoundly, science realizes its possibilities, its role in creating moral values, its responsibility to mankind. This is expressed in the strengthening of the feeling of civic duty of the scientists and their readiness to take more active part in the decisions connected with the social application of their science.

However, in analyzing the above-mentioned social preconditions for the development of science, we must not consider them in a "social vacuum," but in concrete social and economic conditions. The objective trend in the progress of science, its inherent requirements, and its social effect emphasize the necessity for radical changes in the organization of society itself, which must be based on scientifically justified principles.

Criticizing the anarchy of production in the capitalist society of his time, Marx showed that the capitalist system creates material preconditions for planned organization of production and of the entire process of social development. History has fully confirmed Marx's analysis and vision. Today, the scientific and technological revolution makes the main contradictions of capitalism so acute, and so insistently raises the question of the purposeful management of social life, not only on the scale of particular countries, but to a certain extent on the scale of the entire planet, that this problem has begun to receive general recognition.

Fundamental differences between socialism and capitalism call forth differences in the system of organization and management of the development of society. While within the framework of an individual enterprise it is possible to find a

certain similarity in the resolution of many technical and organizational tasks, on the scale of society as a whole, fundamental characteristic features and advantages of the socialist system acquire a decisive importance.

"We communists," noted L. I. Brezhnev in his report delivered at the 25th Congress of the CPSU on February 24, 1976, "proceed from the premise that only in conditions of socialism does the scientific and technological revolution find a true direction, corresponding to the interests of man and society. In its turn, it is only on the basis of an accelerated development of science and technology that the final tasks of the social revolution – construction of a communist society – can be solved."*

The socialist economy is managed in accordance with the principles of planning. This presupposes a system of goals faced by the state; organization of their attainment; long-term planning not only of production but also of a further development of the entire national economy; methods of control and evaluation of results, and so on. The system of planning permits the fullest utilization of a single technological policy, which is called upon to ensure coordination of all the lines of development of science and technology, for intensification of social production.

For a socialist society, the scientific and technological revolution is a natural continuation of the social transformations realized in a planned manner. Its scale and character make necessary a constant improvement in the system of management of scientific and technological progress. The point of the matter is elaboration and implementation in this field of a policy that is justified from every aspect and that is an organic part of the entire complex of management of the social and economic development of society.

The concrete content of a scientific policy is determined by the concrete economic and political tasks of a country, and by the resources that it has at its disposal, as well as by the level and requirements of science and technology itself.

The growth of the role of science within the system of social production has become a most important rule of its development. This role is determined by the momentum of the scientific research and experimental and design activities, by the scale and character of education (including all forms of specialized acquisition of knowledge), and by the growth in the application of the appropriate scientific and organizational knowledge and the effectiveness of this application.

Over the past few decades, science has been transformed into a major and fast-expanding field of application of the labor and material resources of society, one of the most important spheres of social division of labor. Thus, for instance, the number of people occupied in science and scientific service in the USSR has topped 3 million.

The need for raising the educational and cultural level of the members of society calls forth a continuous widening of the scale of education, spreading of different forms of additional training, and improving qualifications of specialists. A

* *Material of the 25th Congress of the CPSU* [In Russian]. Moscow: Gospolitizdat, 1976, p. 47.

fundamental task is the creation of a system of universal and continuous education that can be continued throughout one's life, that would be constantly perfected and its contents constantly brought up to date.

The complex of social problems raised by the scientific and technological revolution is extremely wide and multifaceted. Conscious and purposeful solution of these problems requires a profound analysis of the trends of scientific and technological progress, as well as elaboration and realization of organizational measures ensuring the most favorable conditions for the utilization of science and technology in the interests of social and economic progress.

Addressing the solemn session devoted to the 250th anniversary jubilee of the USSR Academy of Sciences, L. I. Brezhnev said: "Under no social system so far has science occupied such a . . . determining position in the economic and social development as it does under socialism – and the more so under communism that is being constructed. A life-giving source of technical and economic as well as social progress, of the growth of the culture of the people and its well-being – this is what science means for us today."*

PLANNING THE DEVELOPMENT OF SCIENCE AND TECHNOLOGY IN THE USSR

The basis of the planning of science and technology in the USSR was laid in the first years of Soviet power. As early as August 1918, a Department of Science and Technology was set up at the Supreme Council of National Economy, charged with working on the centralization of the planning of science and technology in the country, and with bringing science closer to the needs of production. Since then, organization of this field of activity of the state has constantly developed and improved.

The system of management of scientific and technological progress presently in force in the USSR envisages a clear definition and delimitation of the functions of each of its links. All this work, whose purpose is to combine organically the achievements of the scientific and technological revolution with the advantages of the socialist economic system, is directed by the Communist Party. In accordance with each stage in the development of society, the CPSU formulates the main aims of scientific and technological development. It provides orientation for the activities of the state organs called upon to manage the progress of science and technology. It determines the tasks for the placement and training of the cadres of leaders.

In the "Guidelines for the Development of the National Economy of the USSR for 1976–1980" approved by the 25th Congress of the CPSU in 1976, the prospects for the development of science, for the planned organization of research, and for practical application of their results are singled out in a special section. This docu-

* *Kommunist*, No. 15, 1975, p. 3.

ment emphasizes that the principal task of Soviet science is a further expansion and intensification of investigations of the regularities governing nature and society, a further increase of its contribution to the solution of the topical problems of constructing a material and technical base for Communism, acceleration of scientific and technological progress and of growth in the efficiency of production, improvement of the well-being and culture of the people, and formation of the Communist world outlook of the working people. It is envisaged, in the course of the Tenth Five-Year Plan, to ensure further development of fundamental and applied scientific research in the social, natural, and technological sciences and to concentrate scientists' attention on the most urgent problems of scientific, technological, and social progress. On the solution of these problems, successful development of the economy, of culture, and of science itself depends.

In the coming years, investigations opening new paths to the transformation of the productive forces of our country, to the creation of the engineering and technology of the future, will be vigorously continued. Particular attention will be paid to the improvement of the effectiveness and quality of scientific research, to a constant improvement of the links of science with production, and to speedier introduction of scientific achievements into the national economy.

To manage the development of science, the highest organ of state power – the Supreme Soviet of the USSR – approves the national economic plans and state budgets, a part of which are the plans for development and financing of science and technology. Permanent commissions for public education, science, and culture have been set up within the chambers of the Supreme Soviet – the Soviet of the Union and the Soviet of the Nationalities. These commissions prepare draft laws, carry out preliminary studies of the corresponding sections of the State Plan and the State Budget of the USSR and amendments to them, and control the activities of the organs of State administration.

Overall guidance of the scientific and technological activities in the country is handled by the Government of the USSR – the Council of Ministers of the USSR. As the highest organ of state administration, the Council implements a set of measures for the development of science and technology and for the introduction of their achievements into the national economy. The Council defines and unifies the work of the ministries and departments in this sphere; on the basis of state 5-year plans, it approves plans for financing scientific research and plans for training scientific cadres. Draft state plans for development of scientific research and for the introduction of the achievements of science and technology into the national economy are worked out by the State Committee of the USSR Council of Ministers for Science and Technology and the State Planning Committee of the USSR Council of Ministers. These plans are agreed upon with the USSR Academy of Sciences.

A number of intersectoral organs providing functional services in the domain of scientific and technological progress should be noted. Among them are the State Committee of the USSR Council of Ministers for Material and Technical Supply (Gossnab), the State Committee of the USSR Council of Ministers for Labor and

Social Issues, the Committee for Inventions and Discoveries of the USSR Council of Ministers, the State Committee of Standards of the USSR Council of Ministers, and the State Committee for Prices of the USSR Council of Ministers. Also in this group of organs is the Ministry of Higher and Secondary Special Education of the USSR, whose competence in the training of scientific cadres has an intersectoral character.

For particular sectors of the national economy, scientific and technical policy is implemented by the ministries and departments of the USSR. Scientific research institutes of industry sectors, project design and technological organizations, and scientific and technical services at industrial enterprises and in production amalgamations carry out research and development, and take steps to introduce the results of their work into production.

The state organs of the union republics guide the development of science and technology in their republics. The Supreme Soviets of the republics approve plans for scientific and technological progress, as part of the overall republican plans and budgets. The council of ministers of the republics define activities and spheres of competence of the republican organs of administration, coordinating their activities with the organs of the general state administration of the USSR. A number of sectoral ministries and departments of the union republics find themselves in twin subordination – to the corresponding ministry of the USSR and to the Council of Ministers of the Union Republic. The republican academies of sciences are subordinated to the councils of ministers of the union republics.

The State Committee of the USSR Council of Ministers for Science and Technology (GKNT) is an all-union organ that ensures – in accordance with the directives of the Communist Party and the government – implementation of a single state policy in the field of scientific and technological progress and utilization of the achievements of science and technology in the national economy.

The GKNT works out proposals regarding the main lines of development of science and technology in the country. It makes forecasts for different time spans. It projects the state 5-year plan for scientific research (jointly with the Gosplan, the Gosstroy,* and the Academy of Sciences of the USSR). It identifies the main scientific and technological problems that have to be solved in the plan period and lays out a plan for scientific manpower development.

The GKNT has the right to introduce changes in the tasks on main scientific and technological agenda. It works with the Gossnab of the USSR to manage matters relating to the financing and material and technical support for research and development activities. It implements measures for the development of networks of scientific establishments. The GKNT is also responsible for solving problems of the development of a system of scientific and technological information and on coordination of international scientific and technological relations.

Scientific councils for the most important interbranch problems of science and

* The State Committee of the USSR Council of Ministers for Construction.

technology, scientific–technological commissions, and groups of experts are functioning at the GKNT. Scientific workers of the highest qualifications, including members of the academies of sciences of the USSR and of the union republics, take part in their work.

The Academy of Sciences of the USSR guides fundamental and applied scientific research efforts that appear promising in the natural and social sciences. Many of these are applied in nature, aimed at discovering new possibilities for scientific and technological progress and at improving the management of the national economy. The Academy of Sciences of the USSR, which marked its 250th anniversary in 1975, has rich historical traditions based on broad democratic principles. The 25th Congress of the CPSU pointed out the need for enhancing the role of the Academy as a center of theoretical research, a coordinator of all the scientific work of the country.

The State Planning Committee of the USSR Council of Ministers (Gosplan of the USSR) takes part in the elaboration of scientific forecasts, plans introduction of research achievements into the national economy, and considers proposals on the size of capital investments for the development of science. Together with the Ministry of Finance and with the Gossnab of the USSR, the Gosplan takes part in coordinating the plans for the financing of scientific work and in providing material and technical supply for scientific establishments. Problems of remuneration and working conditions for scientific workers are coordinated with the State Committee of the USSR Council of Ministers for Labor and Social Issues and with the All-Union Central Council of Trade Unions (VTsSPS).

The Committee for Inventions and Discoveries of the USSR Council of Ministers provides general guidance in the development of the inventions and in the rationalization of production for the country. It helps introduce inventions and discoveries into the national economy, protects state interests in the field of inventions and discoveries belonging to the USSR, issues author's certificates and patents for inventions and diplomas to the authors of discoveries, and defends the rights of the inventors.

The work with regard to standardization is directed by *the State Committee for Standards of the USSR Council of Ministers (Gosstandard of the USSR)*. Its most important tasks are standardization of the indices of the quality of production, elaboration and approval of the most important standards of intersectoral application, overall state supervision of the observance of standards, and general direction of the standardization work in branch organs.

An important role in the planning of the development of science and technology and in the practical utilization of their achievements is played by the *scientific and technical societies* whose membership is comprised (on a voluntary basis) of scientific and engineering workers of adjacent branches of science and technology. The activities of these societies are guided by the All-Union Council of Scientific and Technical Societies.

Implementation of scientific policy in the USSR is based on a hierarchical

system of scientific and technological forecasts and plans. In the state system of planning of science and technology, the following levels can be singled out:

- *Forecasting the prospects of development of science and technology for 10–15 years* with regard to the most important directions, and determination of the fundamental scientific and technological problems of that projected development. In present-day conditions, a plan, in particular a 5-year plan, cannot pretend to be justified if it does not take into account the data of the scientific–technological forecasts, which serve as a basis for the plan devised by means of a scientific analysis of the development process. At present, one can count up to 150 methods of forecasting. They are effective in various spheres of scientific and technological forecasting (national economic, industrial sector, and local forecasts). Principal among them are process modeling methods and methods of expert evaluation of development.

Forecasts are prepared by the GKNT, Gosplan, and the Academy of Sciences, with participation by the interested ministries and departments and administrative organs of the union republics.

- *The State 5-Year Plan* of research work and introduction of the achievements of science and technology into the national economy. This plan is an integral part of the 5-Year Plan of development of the national economy and includes tasks related to the solution of the main scientific and technological problems; tasks related to the mastering of new types of industrial production; measures for the introduction of advanced technology, mechanization and automation of production, and creation of automatic control systems and management systems; and, finally, tasks related to the training of scientists in the country.
- *Coordination plans* for solving the major scientific and technological problems. These plans cover the entire complex of work, starting with the formulation of scientific research efforts and ending with utilization of their results in the national economy. Coordination plans encompass all branches of the national economy. They concentrate effort on the decisive sectors of scientific and technological progress and define necessary cooperation among those who carry them out.

Implementation of the major national economic, scientific, and technological programs is realized through the coordination plans. As examples, such integrated programs have been established for the protection of the environment and the creation of the general state system for automatic data processing.

Coordination plans are a basis for the development of the 5-year and annual plans of the development of science and technology of the ministries and departments, union republics, scientific research and project design organizations. At the same time, formulation of the tasks, terms of their fulfillment, and the amount of financial support are established in exact correspondence with the formulations, terms, and finances envisaged by the coordination plans.

Any coordination plan agreed upon with organizations that have to carry them out but that belong to different ministries and departments is submitted to the

GKNT, which considers and approves it, introducing appropriate changes if necessary. Thus, this plan acquires the force of a directive document. Its tasks are mandatory for the ministries and departments to which its fulfillment is assigned. Up to 50 ministries and departments of the USSR and union republics take part in the implementation of some programs, and the total number of scientific organizations and industrial enterprises participating in its fulfillment may be as high as 500.

- *The annual state plan* for scientific and technological work and for introduction of achievements into the national economy is a part of the annual State Plan of the Development of the National Economy, in which the tasks and measures must correspond with the 5-year plan and the system of the coordination plans.
- *Five-year and annual plans for specific industrial branches and republics* are approved by the ministries and departments of the USSR and councils of ministers of the union republics with respect to the scientific organizations and industrial enterprises subordinated to them. Particularly important is the role of the industrial branch 5-year plan, which establishes scientific and technological lines for development of the branch, a rational structure of production, a list of products, and the technical and economic level of its production.

The industrial branch 5-year plan consists of four sections: research and development; mastering new types of industrial production; introduction of advanced technology, mechanization and automation of production, and creation of automatic control systems; and training of scientific cadres. The plan includes tasks of the state 5-year plan; tasks with respect to the coordination plans; proposals of the Committee for Inventions and Discoveries for the utilization of discoveries and major inventions in the branch; orders for new technology from other branches of the national economy; work with regard to the solution of scientific and technological problems that are of considerable importance for the branch, as well as major innovative work from the 5-year plans of industrial enterprises and scientific organizations.

Technical and economic indicators of the newly invented types of production, costs of work, and the necessary capital investments are indicated for all the tasks of the industrial branch 5-year plan. The themes of the plan are determined by the lines of development of science and technology in the national economy and in the given branch of industry, as well as by the necessity of accumulating knowledge in science and technology for further utilization. All sections of the industrial branch plan are coordinated with production plans. The tasks regarding the output of the first industrial series of new products are also envisaged in the production plans.

There are 5-year and annual plans for scientific research institutes, project design and technological organizations, laboratories, and higher educational establishments; and there are 5-year and annual plans for scientific and technological progress in industrial undertakings and amalgamations. It is precisely here that centralized planning "from the top" and initiative "from the bottom" are combined. These plans, aimed at a solution of national economic and industrial branch tasks, offer a wide field of activity for search and initiative.

Thus, thanks to the creation of a streamlined system of planning for scientific and technological progress, based on socialist property and socialist social relations, the state has the possibility of developing, in a planned way, science and technology on a scale for the entire country, to make effective use of their achievements for the creation of the material and technical base of Communism, and a steady rise in the well-being and cultural level of the people.

INTERNATIONAL SCIENTIFIC AND TECHNOLOGICAL COOPERATION

The scientific policy of a modern state cannot limit itself to internal problems. It must also ensure international cooperation in scientific and technological efforts. This is determined both by the international character of science as such, the striving of scientists and specialists to exchange information, and by the scale of the problems whose solution is important to all mankind.

The scientific and technological revolution deepens the processes of internationalization in science, technology, and economics. The trend toward relaxation of international tension, the course toward peaceful coexistence of different social and political systems, permits an expansion of mutually advantageous relations in the interests of all countries. It was noted many times at the 25th Congress of the CPSU that improvement in the international climate and successes of the policy of peace and detente have created a favorable atmosphere for an enlivening of economic, scientific and technological, and cultural cooperation, for its quantitative and qualitative growth.

Differences in ideology and social system are no obstacle to the development of business relations between states, as long as they are constructed on the principles of sovereignty, equality, noninterference in internal affairs, and mutual advantage. Interaction is fostered by the realization of the need for collectively made decisions and for common activity on certain global problems, such as the danger of a thermonuclear war, prevention of an ecological crisis, exploration of outer space, development of world ocean resources, supplies of energy and food, the fight against disease, and development of the advantages of division of labor in some areas of science.

Mutually advantageous cooperation is an effective means for the development of the scientific, technical, and economic potential of each of the participating countries. It allows better utilization of natural and labor resources, concentration of the efforts of the scientific and engineering cadres on the development of priority problems, improvement of the organization of production, and improvement of the economic efficiency of production activities. At the same time, international scientific and technological relations exert an ever-growing influence on the political climate in the world, furthering assurance of international security and creating an atmosphere of trust and mutual understanding.

The Soviet Union has always been a partisan of active development of relations with all states on the basis of equality and mutual consideration of the interests of each party. A characteristic trait of the Tenth 5-Year Plan is an even more intensive participation of the Soviet national economy in the international division of labor and a further transfer of the foreign economic and scientific and technological cooperation to a long-term basis. Relations of this kind are acquiring increasingly great importance among key economic problems.

"One of the specific characteristics of our times is the growing utilization of the international division of labor for the development of each country, irrespective of its wealth and the economic level attained by it," said L. I. Brezhnev in his Report to the 25th Congress of the CPSU. "We, like other countries, too, are striving to utilize the advantages which external economic relations offer for the purpose of mobilizing additional resources for successful solution of economic tasks, for gaining time, for improving the efficiency of production and accelerating progress in science and technology."*

Voices are sometimes heard in the West to the effect that the Soviet Union is, so to speak, unilaterally interested in the development of scientific and technological relations and unilaterally obtains advantages from them. This kind of argument is sometimes raised by people who have never had any direct relation to science and technology or to business. Throwing doubt on the decisions of businessmen who, it would seem, are most competent in the evaluation of both the level of technology and mutual advantageousness of working together, they resort to an argument that, in the words of the seventeenth-century English philosopher Francis Bacon, could be termed *idola specus*.

Among these "cave illusions" or prejudices one should, in particular, place the myth that the Soviet Union, apparently, cannot do without the economic and technical help of the United States and other Western countries, that it is striving to utilize economic and scientific and technological cooperation to strengthen its military and industrial potential. Another variety of these "illusions" is connected with the assertion that the Soviet Union needs this economic and scientific and technological cooperation so much that it is possible to dictate to it conditions that mean interference in its internal affairs.

No matter what the basis of these opinions, they cannot be left unanswered, because they may throw us back to the old situation and put the fate of humanity under a threat. Naturally, the Soviet Union, like all the other countries in the world, is interested in broader participation in the international division of labor, in the utilization of the advantages of this division of labor for its own economic development. However, our position of promoting new foreign economic relations is not dictated by this consideration alone. The striving of the Soviet people for cooperation is not dictated by weakness but by a profound belief that today there is no

* *Material of the 25th Congress of the CPSU* [in Russian]. Moscow: Gospolitizdat, 1976, p. 56.

other way left except peaceful coexistence constructed on honest, mutually advantageous cooperation.

The economy of the USSR is growing at a steady rate. Producing a fifth of the world's industrial output, the Soviet Union acts in the international market as a major exporter of a wide assortment of goods, from industrial raw materials to the most sophisticated modern equipment and entire industrial complexes. Our country has at its disposal all the necessary resources to ensure the possibility of independent development. Its scientific and technical potential permits it to solve problems in any modern field of production. The successes of Soviet science and technology, in many fields of which the USSR occupies a leading place in the world, are generally known.

At the same time, the Soviet Union constantly implements the political course of using all that is best in world scientific and technological experience. It strives for the development of scientific–technological and economic relations with all states that are prepared to engage in mutually advantageous cooperation. In this respect, we, naturally, have in view not only utilization of experience of other countries but also transfer of our own scientific and technological achievements to the interested states. It should be stressed that the socialist planned system of economy creates a solid base for such a cooperation and permits its development on the basis of stable long-term relations.

Practical experience shows that countries that have active scientific and technological as well as economic ties with us obtain many advantages, including those of a trade and economic character.

The closest economic and scientific and technological cooperation is being developed by the USSR with member countries of the Council of Mutual Economic Assistance (CMEA) within the framework of the Complex Program of Socialist Economic Integration.

The scientific and technological cooperation between member countries of the CMEA is realized on both a bilateral and multilateral basis. Multilateral scientific and technological cooperation has been particularly extensively developed. At present, 270 problems are being worked out on this basis, encompassing, practically speaking, all the main lines of development of science and technology.

One program, for instance, involved collaborative development of the fuel and energy base of the CMEA member countries. Solution of this problem is of vital importance for the long-term development of the national economies of the socialist countries. It is becoming increasingly obvious nowadays that the task of satisfying the requirements of mankind for fuel and energy resources can be successfully solved only on an international basis by the joint efforts of all interested countries. First experiences have shown that the CMEA countries in the main are successfully solving the problem of providing their economies with the most important types of energy and raw material resources. Their efforts in this direction can serve as a good example to other countries in the world.

Another example of cooperation is the joint design and manufacture of a system

of machine tools with digital programmable control. We are also working together successfully on investigating measures for protecting metals from corrosion and on the development of a single system of electronic computers ("Ryad"), a series of fully compatible models that can operate according to common programs using a single type of hardware and a single type of software.

Scientific and technological cooperation in the timber and wood products industry is aimed at the development of "an integrated utilization of wood raw material," an important national economic concern. Solution of this problem will enable the CMEA countries to meet more fully the requirements of their national economies for wood and wood products.

Another important part of scientific and technological cooperation is the exchange of specialists. In this respect, joint training of scientific teams permits these countries to satisfy their requirements not only on the basis of their national establishments but also on the basis of newly established international institutes, laboratories, and departments.

Of particularly great practical importance is the scientific and technological cooperation connected with the realization of specialization in related areas of production of country-members of the CMEA. We have jointly solved problems of mechanization, electrification, and automation of production processes in individual branches of agriculture and forestry; perfected new types of plastics and semiconductors; and developed new industrial catalysts, among many other achievements. Cooperation is accompanied by the transfer of advanced experience and achievements in all the fields of science, technology, and production, as well as specialization and coordination of research and project design.

Scientific and technological cooperation among CMEA countries now embraces the newest lines of research and development in such fields as biological physics, protection of nature, and study of the resources of the world's oceans.

All this makes it possible to utilize most quickly and effectively the achievements of science and technology in the national economies of the CMEA countries, to create the necessary scientific and technological potential in the interests of socialist countries, and, in the final result, to solve problems of social progress with the least expenditure of social labor.

In marking the twenty-fifth anniversary of the CMEA, its member countries again confirmed the open character of this organization. Finland has become the first Western country to express a desire to cooperate directly with the CMEA.

The USSR increasingly expands trade and economic relations, as well as scientific and technological contacts, with developing countries on the basis of long-term intergovernmental agreements. Alongside the technical assistance rendered to them, more and more importance is being given to parity-based scientific and technological cooperation that favors the creation and furthering of their own potential in science and technology.

The trade-and-economic and scientific-and-technological relations of the USSR with the countries of the West have developed considerably over the past 10–15

years. While at the beginning they were limited mainly to mutual familiarization with scientific and production achievements, in the past few years a transition to systematic long-term cooperation on a contract basis has been taking place. Forms of this cooperation are extremely varied: exchange of technical information, organization of mutual visits to become acquainted with scientific and production achievements, reciprocal invitations of scientists and specialists to give lectures and for consultations, organization of national and company exhibitions, measures enabling people to work in scientific research establishments and in enterprises, the purchase and sale of licenses, organization of joint scientific research and design projects, and so on.

Contacts with scientific organizations and firms in a number of countries date back many years. The experience of business relations accumulated in this connection has created preconditions for the conclusion of intergovernmental agreements on scientific–technological and economic cooperation of many kinds, up to and including joint study of specific technical problems and development of technological equipment.

Intergovernmental agreements are supplemented by a great number of agreements in particular fields of science and technology concluded both on an intergovernmental basis and between individual scientific and industrial organizations and firms. A specific feature of the present stage in business cooperation is its transfer to a long-term basis through development of programs of economic and scientific–technological cooperation for a 10-year period.

A permanent mechanism of cooperation has been set up with all countries with which the USSR has such intergovernmental agreements. As a rule, they are mixed bilateral commissions. Apart from that, permanent and temporary working groups are being set up. They are formed either on the industrial branch basis or for consideration of concrete programs of cooperation with regard to definite scientific and technical or economic projects. Of course, intergovernmental organs of cooperation do not set themselves the task of centralizing all work. They devote their activities to the study and solution of problems that are of a strategic nature in the development of cooperation, encouraging direct contact between interested organizations that make concrete decisions, make business deals, and establish scientific and technological relations regarding the questions that are of interest to them.

Experience shows that the greatest effect is attained when scientific–technological and trade–economic cooperation are organically connected. Such a close intertwining becomes inevitable when relations acquire a long-term character. As a matter of fact, if one is to speak not about sporadic commercial deals but about real economic cooperation on a long-term basis, it is evident that this presupposes consideration of the possibilities for a definite specialization and cooperation in manufacture and mutual deliveries. It involves not only commodities and technological equipment that exist today, but also those that will be made tomorrow. It is natural, therefore, that partners in cooperation, before undertaking specific

obligations, must first get to know one another well, evaluate jointly the scientific and technical level of what is to be designed, and discover the most expedient ways of solving problems.

On the other hand, scientific and technological cooperation on any sizable scale cannot be realized if it is separated from its economic and financial consequences – i.e., if the scale of expenditure and of risk, possibilities for appropriate compensation, provisions for exchange and mutual sale of licenses, and the like are not taken into account.

It is these specific features – the organic interrelation between scientific–technological and economic cooperation – that determine the activities of the GKNT and industrial ministries of the USSR in the development of scientific and technological relations with foreign partners.

As has already been mentioned, intergovernmental agreements open up possibilities for scientific and technological cooperation not only with governmental organizations but also with private firms. The legal form of this type of relations is, as a rule, an agreement or protocol about scientific and technological cooperation concluded between the GKNT and Soviet industrial ministries and their foreign partners. At present, the GKNT has cooperation agreements with nearly 150 industrial and scientific organizations in capitalist countries. Within the frameworks of these agreements, direct cooperation between the appropriate Soviet industrial and scientific organizations and foreign firms is organized for the purpose of solving concrete scientific and technological problems chosen by the parties.

Business relations between foreign firms and Soviet organizations are extremely varied. The practice of exchange of technology through licensing and patent agreements, or joint scientific research and experimental design projects, is becoming increasingly widespread. Coordination of research and development work with respect to some selected problems is very effective.

Joint efforts for the construction of industrial undertakings, founded on joint financing and deliveries of equipment and subsequent repayment of credits with finished products from such factories, is acquiring great importance. This type of cooperation, which has been termed "compensation deals," is beginning to spread ever more widely.

In considering the possibilities and paths for scientific and technological as well as economic cooperation, the striving of the USSR to develop business relations on a multilateral as well as a bilateral basis should be emphasized. Of great importance are the prospects for mutually beneficial cooperation that have opened up as a result of the successful conclusion of the General European Conference in Helsinki, whose documents stress the necessity of developing scientific–technological and economic cooperation on the European continent.

The Soviet Union is a member of over 500 international organizations – economic, scientific and technical, cultural, and others. Thousands of Soviet specialists – scientists, engineers, economists, cultural workers – the Academy of Science of the USSR, scientific research institutes, scientific–technical societies and many other

organizations take part in their work. Our country takes an active part in the scientific and technical activities of the United Nations and its regional organs and specialized institutions.

We realize the complexity of establishing and strengthening these contacts and their dependence for continuation on the world political climate. A tremendous amount of work has to be accomplished to reveal further concrete possibilities of organization for broad and mutually advantageous cooperation, which is the right path toward the strengthening of universal peace and friendship among all peoples.

8 The System of Price Planning

R. A. Belousov

The system of price formation in the USSR fulfills three basic functions:

- *An accounting function.* Planning authorities use price mechanisms to measure the volume of the social product, the national income, production costs, and other economic parameters.
- *A stimulation or incentive function.* Planned prices, established on the basis of socially necessary expenditures, create the incentive to run the economy in an efficient manner, to adopt the latest achievements of science and technology, and to improve product quality.
- *An income distribution function.* Prices serve to distribute and redistribute the national income in accordance with overall social policy. For example, relatively low retail prices for children's goods serve to redistribute part of the national income to the benefit of families with a large number of children; the system of price formation is the effective agent here.

MAJOR TYPES OF PLANNED PRICES AND THEIR STRUCTURE

Three types of planned prices operate in the Soviet economy: purchase prices, wholesale prices, and retail prices. The collective farms and state farms sell their agricultural produce to state organizations and enterprises for processing at *purchase prices.* Purchase prices are pegged at different levels for different parts of the country on the basis of production costs in agriculture, with adjustments made for differing crop yields and the production of livestock. These prices fully cover current expenses of the state and collective farms, and ensure accumulation for expanded production as well as an accumulation of funds for pensions, insurance, and other such funds on the collective farms.

The products of industry are sold at wholesale prices within the state sector, i.e., in commerce among enterprises, trading organizations, and other agencies. Currently, two types of such prices are used:

The *wholesale price of enterprises*, at which products are sold to marketing agencies. This price comprises the planned cost of the product plus a planned profit. The sales volume, financial indicators, and other parameters in the plan for an enterprise are calculated on the basis of these wholesale prices.

The *wholesale price of industry*: this price exceeds the corresponding enterprise wholesale price by a margin that constitutes the markup for the selling agencies. In some branches of industry, this price also includes a turnover tax; in the extractive industries, it includes payments representing differential rents among mines.

It should be pointed out that for most means of production, only enterprise wholesale prices are established; these prices include a fixed percentage as an added allowance to cover the outlays of the selling agencies. Enterprises pay for raw material, energy, and equipment at industrial wholesale prices. Agricultural equipment, fuel, fertilizer, and other industrial wares are sold to collective farms at these prices.

The transport rates for all types of cargo shipping services are one kind of wholesale price. These rates are planned according to the same procedure as used for planning wholesale prices in industry.

The state *retail prices* are the final prices at which goods are sold to the population. The economic role and function of these prices are more multifaceted than that of other types of prices, giving them a special status in the planning system. Every change in retail prices is immediately reflected in the real income of the population and hence has broad social and political implications. Retail prices are an important instrument in Soviet economic policy, and one of their aims is to effect a steady improvement of the people's well-being.

Statistics on the average expenditure by sector, and in some cases by region, for the production and sales of a particular product are used to set initial retail prices. Retail prices are also widely utilized as an instrument to redistribute the national income among the different groups of working people, and for this reason retail prices tend to diverge from costs. In actual planning, this feature is taken into consideration in setting different levels of profitability and different turnover tax rates for different goods. As a consequence, some goods are relatively cheaper and some relatively more expensive as compared to production costs. The retail prices for many products sold on a large scale (e.g., books, school supplies and writing materials, products for personal hygiene and health) generally bear no turnover tax at all. In this way, retail prices serve as an instrument to promote the improvement of education and the level of culture among the entire population, and to maintain and improve the health of the people.

Retail price planning is done to be consistent with planning of the balance of

national income and expenditure, and with projected increases in salaries, pensions, and social consumption funds. Retail prices play an important role in shaping the perceived needs of the population and are instrumental in maintaining a balance between supply and demand. A fall in retail prices brings about a rise in demand. Therefore, it is necessary to maintain a certain level of reserve stocks if prices are to be reduced. Here it is necessary to take into account elasticity coefficients, which are an expression of the tendency of the quantity demanded of a product to increase disproportionally to a decrease in its price. A part of the released funds are used by the population for the purchase of some other goods, where prices have not changed.

The retail prices of most products are the same throughout the country so as to validate government wage policy, but prices of some products with high transport costs are set regionally. Regional prices are used mainly for foodstuffs (meat, bread, sugar, fish products, fruit) and for nonfood products that are difficult to transport and are generally produced for local markets (furniture, lumber material).

Rebates to trade agencies are given to cover the costs of distribution and to enable these agencies to make a profit. These rebates are set as percentages of the retail prices or defined as the difference between the wholesale price and the retail price. Rebates vary according to the commodity and the distribution costs (expenses for storage, transport, repackaging, and the like). They are set by pricing authorities (the State Pricing Committee of the USSR Council of Ministers, among others) in conjunction with retail prices.

Table 8.1 provides an idea of price movements in the national economy of the USSR. As one can see, the rise of wholesale and retail prices, that took place during World War II, stopped during the 1950s. Since then, a considerable lowering of prices has taken place, and the price level has tended to stabilize. Purchase prices for the agricultural production, in contrast, have risen considerably during recent years. This reflects the large amounts of financial assistance to the rural population that has been provided by the state.

The structure of prices and their trends are governed mainly by two elements: the prime cost and the net income (which includes profit and turnover tax). Over the last decade an important change in the trend of the wholesale price structure is observed – that is, the portion of turnover tax has decreased, and that of industry profits has risen. This trend reflects the fact that the importance of the part played by working collectives in solving economic problems has grown considerably and also that in price planning national and collective interests are coordinated in a more harmonious way.

BASIC METHODOLOGICAL PRINCIPLES

The efficiency and thoroughness with which price planning on the various levels is coordinated depends critically on the depth of our knowledge of the factors

TABLE 8.1 Indices of Purchasing, Wholesale, and Retail Prices in the National Economy of the USSR (1940 = 100)

Price	1940	1950	1960	1965	1970	1975
Purchase prices of agricultural products	100	188	558	777	970	970
Wholesale prices of industrial production (with turnover tax)	100	170	129	127	136	133
Retail prices	100	186	139	140	139	139

that determine price levels and structures in a given plan period. Soviet economists have recently completed a series of multifaceted studies on planned price formation and have empirically tested many methodological premises both by mathematical models and in practice. Some of the most important of these premises for price planning are as follows:

- The law of price movement is the law of value. This means that price relationships for particular commodities tend, over the long term, to approximate the proportions of human labor and materialized labor expended on their production. Thus, in setting plan prices, the adjusted average norms for expended labor rather than individual costs are used, since these average norms reflect the object conditions of the manufacture of the bulk of a particular commodity, given average level of skill and intensity of labor.

The planning agencies regulate price levels and price relationships in accordance with the cost premise so that the sale of the finished product will return the cost of production plus a profit to every industrial collective (factory) that performs in accordance with the norms established by the state plan. Since prices are based on adjusted, average outlays, the factory that works more efficiently and economically will obtain a greater profit and bonus; conversely, higher than normal labor costs will give an enterprise poorer cost-accounting parameters. Thus, the system of planned prices automatically imposes material sanctions on such enterprises and amalgamations by reducing their incentive funds.

- Conceptually, the socially necessary amount of labor expended should also reflect the asset intensity. This means that the relative prices of commodities should reflect the relative amounts of working expenses and fixed assets. For example, the prime cost of production of 200 m^2 of plywood is the same as that of 1 ton of plastic, but the ratio of investment required for increasing production capacity is 50 percent greater for plastic. Hence, the price of 1 ton of plastic should be higher than that for 200 m^2 of plywood.
- The quality of substitutable commodities must also be taken into account in

setting prices. Products with better consumer properties usually have a higher price. By observing this principle, enterprises that have undertaken the production of new or improved articles are able to function on a financially sound basis. Additional expenses incurred for quality improvement are recovered through higher prices, and the profitability of the given manufacture is increased by adding a supplementary amount to the wholesale price.

- In the extractive industries and in agriculture, wholesale prices and purchase prices vary according to area. In setting these prices, special attention is given to the expenses of enterprises operating under relatively inferior natural conditions. The practical implementation of this principle requires the introduction of rent payments or an appropriate territorial price differentiation for the same product.

For example, the effective wholesale prices for crude oil were set for seven areas with a difference of 1:3, while for gas these prices had a differential of 1:4 set for eight areas. Then, within these different areas, the prices for oil and gas are set on the basis of the extraction costs of enterprises operating under relatively poorer natural conditions, while those with superior deposits were required to make rental payments to the government.

Recently, purchasing prices for grain, sugar beets, sunflowers, and other agricultural products have undergone a sharper differentiation. However, price variations are purposely set to be less than the variations in cost. This stimulates specialization in the production of individual products under the most favorable natural conditions.

- Finally, plan prices take into consideration supply-and-demand relationships for certain types and groups of products. Supply and demand is a form of interaction between production and consumption that is inherent to commodity–money relations. An important task of planning is to achieve a balance, or equilibrium, in these relations, which will depend on the following circumstances: (a) the volume and structure of production; (b) the level and structure of needs; (c) the size of money incomes; and (d) price levels. Thus, we see that prices are only one of several important factors involved in maintaining a balance between supply and demand. It is important to emphasize that, in a planned economy, prices are used only to regulate the structure of supply and demand by effecting changes in price relations. For example, a sharp decrease in the price of watches brought about a substantial increase in the demand for them among the broadest layers of the population, while relatively high prices for automobiles restrict the demand for them.

PRICE PLANNING METHODS

To plan the wholesale price of a commodity correctly, its planned cost price must be defined and the amount of the net profit scientifically determined. To do this, the following parameters are established: the planned cost of production of the commodity; a standard of profitability; a price relationship for substitutes for the product.

All parts of the planning system, from national agencies to the individual enterprise, participate in establishing and discussing these parameters.

Enterprises and associations prepare the initial data, including the calculated cost of production and projected new prices, as well as arguments supporting them. This information is given directly to the local authorities, to republic price committees, or, through the national ministries, which have special price divisions, to the State Price Committee of the USSR Council of Ministers.

The Soviet Government controls and regulates the general level of wholesale, purchase, and retail prices throughout the country. Its agency for this, the State Price Committee, examines information on prices supplied by enterprises and amalgamations through the national ministries, and ratifies the wholesale prices for a major portion of the output of heavy industry, thereby ensuring an effective marriage of economic and technological policy. It also approves many of the wholesale and retail prices for consumer goods, thereby ensuring a unified incomes policy for the population.

The agencies for price formation at the republic level examine and approve wholesale prices for some of the output of heavy industry sold for the most part within the territory of the given republic, as well as the wholesale and retail prices for consumer goods.

The price-setting agencies of the autonomous republics, and the executive committees of district, regional, and municipal soviets of people's deputies examine and approve prices on goods produced by local industry to be sold within the region, as well as certain objects with limited storability, since these require day-to-day price reviews to reflect local market conditions (for example, fruits and vegetables).

Three different types of review and adjustment of prices associated with special economic and methodological considerations should be distinguished: (a) regular adjustment of prices within the system of planned price formation – i.e., price setting on new or approved articles and day-to-day adjustments of price levels and product profitability indicators for items already in production; (b) general reviews of wholesale prices on all items produced in a given industry or group of industries – i.e., a radical restructuring of the very system of price planning; (c) the working out of projected wholesale prices.

The principal problem in ongoing price regulation is to maintain the appropriate level of profitability to interest producers in manufacturing the whole range of products called for in a plan, and to establish relative price incentives among substitute items so that quality improvement will be stimulated and the technological improvements will be rapidly introduced. The price structure must also serve to conserve items in short supply.

To examine the mechanisms by which the conflicting interests of producers and consumers are coordinated in the planning of prices, one must have an understanding of the objective limits within which prices may be varied. The *lower* limit for a wholesale price on a new or improved item is determined by the interests of typical production units that manufacture most of the output of the item.

Experience shows that the costs for research and design of new articles tend to rise. In addition, in its first one or two years in production, the production costs of a new item are also relatively high. These additional costs are covered from a special fund for the adoption of new technology. As a result, the lower limit for the wholesale price of a new article is set on the basis of the planned prime cost, usually in the second year of mass production, and reflects the average profitability indicators. In this way, the normal economic costs governing the production of new and old models are equalized.

The problem is complex because the price must stimulate not only production but also innovation, and it should also provoke the interests of the consumer in a new item. Planning agencies therefore determine the other objective limit of policy in the area of price formation – the *upper* limit for wholesale prices.

The upper limit of wholesale prices is based on the economic efficiency of a new or improved item in comparison with its predecessor. Roughly, the upper limit of wholesale prices is determined according to the formula

$$P_p = aP_0 + E,$$

where P_p is the upper limit of the wholesale price for a new but substitute item; P_0 is the price of the base commodity; a is the implicit index of substitutability (e.g., the ratio of the productivity of machines; and E is the user's saving in operating and capital outlays as a result of general application of the new item. The upper limit of wholesale prices describes the nominal value of the superior properties of the substitutable item at which it is equally advantageous for the user enterprise to use either the old item or the new, improved one.

The following main methods are used to calculate maximum price, and hence the economic effect of improving the user qualities for material inputs for planned price formation. The first and simplest method defines the upper-limit price as a function of one principal property of the new item for the user:

$$P_p = P_0 \cdot (G_s^1 / G_s^0),$$

where G_s^1 and G_s^0 are the principal characteristics of the new and the old items, respectively. In this case, one parameter is chosen that, however, may quite fully reflect the saving from replacing one item by another. This parameter could be, for example, the durability of tires, the average life of an instrument, the content of active ingredients in mineral fertilizers, the heating capacity of fuels, the binding properties of cement, or the cutting capacity of special lathes. Despite some tentativeness of this method, since all characteristics of the items are not considered, it is simple and accessible.

A second method is used to compare the efficiency of substitutable production goods that possess several different technical properties, each of which is important for the user (for example, in comparing different grades of coal, parameters such as ash content, moisture content, and lumpiness are taken into account). In this method, more complicated mathematical analyses are used to examine the influence

of each of the parameters for such characteristics on the attractiveness to the user of employing the article. The accumulated data in the form of a sliding scale, are used to estimate quantitatively the correlation between the economic effect realized and the quality of interchangeable items.

The maximum price of the replacement article is set so that the expenditure (or volume of profit) of the user enterprise will be the same whether it uses the new or old item. Particular classes of expenditure would rise or fall, depending on the differences between the useful characteristics (qualities) of new items. But these variations (effects) are offset by proportional differences reflected in the upper limit price.

Let us illustrate such a calculation. Raw material of different grades may be used in the production of superphosphate (e.g., apatite concentrate or Karatau phosphorites). For simplicity, let us assume that the specific consumption of the two types of raw material per unit of final output is the same. In the first case, the prime cost of 1 ton of superphosphate is 90 rubles, including 34 rubles for apatite concentrate and 36 rubles for sulfuric acid. Since the useful properties of apatite concentrate are expressed in accounting units, the prime cost of superphosphate produced from it is assumed to be constant.

When Karatau phosphorites are used, the specific consumption of sulfuric acid is 1.4 times greater, and in monetary terms the cost will be 50 rubles per ton of superphosphate. The other classes of expenditures add 23 rubles as a result of the increase in the labor productivity and asset intensity. Thus, all expenses, with the exception of the costs for the raw material, amount to 73 rubles. If we subtract this sum from the constant prime cost of 1 ton of superphosphate, we obtain the limit expenditure or the limit raw material price at which the economic indicators for the user does not change, namely 17 rubles (90 – 73).

In very complicated cases, a mathematical programming apparatus is used to obtain the upper-limit price. Here, the social utility of interchangeable means of production depends on the conditions and time of their technological utilization. For example, kapron (a kind of nylon) is used in the machine-tool industry, in the production of cord, cables, grids, toys, and dolls, and in the manufacture of other articles, with different economic effects in each case. The question of deciding the best allocation of limited resources arises, and it is here that an optimal mathematical programming apparatus is necessary.

In solving the dual problem each of the substitutable inputs under examination is given an explicit value characterizing its quantitative influence on the change in the objective function. Such an estimate quantitatively expresses the rise (or fall) in the target function when the volume of the particular limited resource increases by one unit. Because of the limited availability of some types of equipment, raw materials, or supplies, substitutes of poorer quality must be used in production. For example, because concentrated ores are in short supply, relatively lean ore must be used in blast furnaces; this reduces furnace productivity, raises the prime cost of pig iron, and so on: in other words, it affects the target function. In like

manner, less efficient coal is used in electric power stations because of limited gas resources. In some enterprises, it is sometimes necessary to use obsolete machinery.

Under such conditions, it is important for planning purposes to know the effect that can be obtained from the use of additional units of superior raw material, fuel, or equipment. Solution of the dual problem also gives an answer to this question. The ratings obtained describe the result of the best use of a higher grade production resource, with all other conditions in the objective function remaining the same.

In this case, "best" means "most efficient," with the increment in the target variable serving as the criterion of efficiency. Efficiency in turn depends on which of the interchangeable resources is used in the given technological process (e.g., whether to use gas or high-grade coal in electric power stations), and on the use to which the customers put the substitutable outputs. Thus, chemical treatment of 1,000 m^3 of gas gives 2–3 times greater profit* than if it is burned in electric power stations. Obviously, the best case would be when both these circumstances are taken into account. Since under such conditions we must analyze a large number of alternatives, it is expedient to use computers for processing the data and executing the computations.

The allocational evaluations obtained through mathematical programming represent a relatively new type of pricing decision aid, and the clarification of their precise economic meaning has provoked considerable debate. The problem lies in the fact that in those linear programming problems where the objective function is expressed in monetary terms, the solution to the dual problem is expressed in terms of costs. This has caused some economists to equate this evaluation with price, i.e., to see price as the monetary expression of cost.

Indeed, in many (although not all) problems, such evaluations do describe the economic effects in monetary terms. This is the effect that arises when mutually substitutable resources with different useful properties are consumed in technological processes. A high rating for a given product in the dual problem (e.g., gas as compared with coal), means, in economic terms, that it has a higher quality than its substitute under the specific conditions or use fixed by the constraints placed on the original problem. Thus, the evaluation of the dual problem provides a parameter to characterize the similarity of the qualities of the substitutable inputs in meeting the same set of requirements. Such evaluations are usually general

* Profit is the income of an enterprise from its economic activity for a certain period of time (month, quarter, year). Profit is not the goal of an enterprise in the USSR. There are quite a large number of enterprises in our country that do not realize any profit at all, but whose output is in accordance with the tasks of the national economic plans.

There can be distinguished two kinds of profit: realization profit and balance profit. Profit made as a result of realization is the difference between the income received by the enterprise for the output sold at wholesale prices and its cost price. Balance profit includes in addition some other income received through sales of packing materials, additional payments connected with regional price differences, and penalties received and paid.

and multiple. They integrate several properties of the resources – the content of metal, silica, and sulfur in an ore; its lumpiness; and so on.

The generalized expression of the effect obtained by the user from the entire aggregate of better user properties yields the upper limit of the plan price for the superior resource, or input.

Once sound upper and lower limits for prices are established, planning agencies are able to steer prices consciously, thereby stimulating the producers or the users of a given product, depending on the direction sought. The planned wholesale price (P_{pl}) in practice is set somewhere between two limits at a such level that favorable incentives are created for its production and for the adoption of superior types of products:

$$P_{pl} = P_n + k(P_p - P_n),$$

where P_{pl} is the planned wholesale price; P_p and P_n are the upper and lower limits of the wholesale price, respectively; and k is a coefficient determining the proportion to which the economic effect of the new product is distributed between its producer and its user.

Plan wholesale prices for a new product are set either without any limitations on the period during which they will be effective or with an indication as to when they will change. In other instances, a graduated price practice is followed whereby the planned wholesale price is designed to fall by stages as mass production progresses according to plan. The typical sequence in such a case is as follows.

In the first step (1–2 years), graduated prices stabilize around the upper limit level (the discrepancy should not be less than the standard of efficiency of the new technique) so as to enable the increased costs incurred during the period of introduction of the product to be covered and to ensure a relatively high profitability in production. During this time the user receives a minimal saving corresponding to the given standard. During the second period (3–5 years after the start of the new production), when mass production is established, the prime costs are reduced, and the market becomes saturated. Under these conditions, the price should be reduced to a level ensuring an average norm of profitability. Finally, during the last (third) stage, the price level for the user remains unchanged (so as not to create artificial demand for obsolete articles), while the producer is obliged to make fixed payments to the budget. If an enterprise substantially modernizes an item, an extra amount is added to the wholesale price at that stage. This system seeks to ensure that the cost per unit of social utility of the particular type of item will decrease over time.

One of the new methods of price formation that has become widespread in the knitwear industry is the "normative method." This provides that prices be set by the ministries themselves, or by amalgamations, on the basis of certain standards and with a price-setting procedure approved by the central authorities. Here, the most important item in the prime cost, the outlay for raw material (fabric), is determined by empirical coefficients and formulas estimating the relationship

between the total amount of fabric consumed and the area of the pattern for a particular piece of clothing. The central authorities approve such coefficients as well as standards for work capacity and other outlays, depending on the level of complexity of the given item of clothing. They also set profitability norms. On the basis of this information, a producer calculates for himself the price of a new item of knitwear with the following formula:

$$P = S_t + S_p + S_f + Z + M + T_s$$

where S_t, S_p, S_f are the costs of the fabric, the accessories, and the fittings, respectively; Z is the expense of processing and finishing (including other costs); M is the profit rate, and T_s is the wholesale discount.

Using this method, it is possible to expand considerably the range within which the ministries and enterprises are able to act independently in questions of price formation and to set prices for new types of products.

The approved wholesale prices are published in special manuals that list products by name, along with their principal quality indicators, their State Standard Specifications as to their technical characteristics, their wholesale prices, the size of discounts or supplementary charges, their uses, and their delivery terms. Most types of industrial raw materials, fuel, semifinished products, and equipment are obtained by their purchasers at a nationwide standard wholesale price. In this way, consistent planning is promoted, and economic and financial indicators for the national economy are facilitated. As mentioned earlier, for some industries where transportation costs constitute a large share of outlays, a series of regional standard prices is set up (products of this kind include petroleum products, lumber, and consumer goods). Or price will sometimes be based on the region in which they are extracted (e.g., coal, iron ore, peat).

Since there are various ways in which transportation costs are reflected in prices, certain differences find their way to the customer. In some cases, the transportation fee is paid by the producer, and then the price is set FOB station of consignee or even FOB buyer's warehouse. A price of this type is convenient for the consumer enterprise since its qualitative plan indicators are not affected by which supplier is chosen in the materials and machinery supply system. As is known, an enterprise may change suppliers several times during a planning period. FOB station-of-consignee prices are set for ferrous metals, petroleum products, lumber, cement, and for most consumer goods (fabric, shoes, clothing, for example).

In other cases, transport costs are borne by the purchaser. The price is set FOB point of dispatch (these prices include coal, chemicals, machinery and equipment, and some consumer goods). In this case, the buyer bears expenses that vary, depending on where he gets the items he needs. In this way, prices serve to encourage relationships between producer and consumer that minimize transport and to encourage the efficient location of industry.

Ongoing price regulation has brought about a stable quantitative improvement in the levels and structure of costs of individual products. However, it is sometimes

necessary to introduce qualitative changes in the entire price system as new principles of price formation are worked out, or because a sharp discrepancy arises between current prices and changed economic conditions of production or use of an item. In such cases, the wholesale prices are given a complete or partial review covering hundreds of related price lists for various articles. These reviews require long and careful preparation.

In the first stage, the general principles and main trends in wholesale price adjustments are determined, and consolidated indexes calculated for transition to the new prices on the basis of a mathematical economic model of the input–output relations set by the plan. In a general review of wholesale prices, the overall financial system of the entire economy must be made to balance out. Consequently, it is necessary to determine the quantitative correlations of production and distribution of the surplus product in monetary terms. To this end, a summary balance of financial resources is worked out in terms of the current prices and the new prices. This balance reflects on the one hand, the proportion among sources of net income in the economy, and on the other, the main channels in which that income is expended.

An important feature of a general review of wholesale prices is that it is usually carried out in connection with an improvement in the basic principles of planned price formation. The outlays that enter into prime cost calculations or are excluded from them are determined more precisely, and the foundations and standards used to determine profitability are reviewed. Thus, while profit had formerly been included in the wholesale price as a definite percentage of the prime cost, this principle was changed after introduction of the economic reform in the mid-1960s.

After the government approves the main directions and basic principles of a general wholesale price review, new price lists for particular items are worked out. First, lists are made up of the items for which new wholesale prices are to be set, taking into account the trends of technical progress and the economic effects of substitutable products. As a rule, new standards and technical specifications are worked out, especially in the machine tool industry, and the products on the price lists are brought up to date. At the same time, their technical specifications and quality indices are set, new standards and technical specifications are worked out, and existing ones are revised.

In determining new wholesale price levels and new quality indicators for stocks, planned calculations of prime costs are used. Since prime cost is a monetary category, its projected level should take into account any changes in cost brought about by wholesale price changes for raw materials used, or for fuel, electricity, or transportation fees. Cost increases or reductions are usually determined by recalculating the specifications of all materials in terms of the new prices, and, in the case of uniform price changes in the entire group of material expenses, by using consolidated coefficients.

Before wholesale prices become effective, plan figures are converted into the new prices, and the effect of price adjustments are precisely determined; in addition,

all the indirect effects of the new prices are explored, and adjustments are made in financial parameters.

General and partial wholesale price reviews are thus very complicated and time-consuming operations. They require years to prepare. The new prices, which are based on specific information, do not always correspond to the actual conditions of production and sale. Hence, a number of problems that formerly were tackled within the framework of general price reviews are now dealt with in the course of ongoing price formation, and in the planning of future prices.

In order to give a unified direction to the practice of ongoing price adjustments, and to link it with the overall trends of economic development and growth, projected prices are set down when the 5-year plans are worked out and approved. The system of projected prices provides a more solid foundation for all the economic levers, and for the summary indicators of economic planning and project drafting. These projected prices involve price indices for changes in the value of commodities produced in each sector of industry, as compared with some baseline figure, as well as the absolute values of prices for 200–300 of the most important articles for the planning authorities and design offices.

Calculation of new price levels for particular industries provides a general characterization of the new price system, reflecting changes in output prices as well as changes in the cost of inputs. Projected wholesale prices for the major products are then determined on the basis of plan calculations and indices for the transition to the new prices, which have been obtained from calculations carried out with the input–output model.

9 Organization of Planning of the Foreign Trade of the Soviet Union

V. B. Spandaryan

Foreign trade and other forms of foreign economic ties enable the involved parties to exploit the advantages of international division of labor and to raise the efficiency of their national economies. The present stage of economic development of the USSR is characterized by an increasing growth of foreign economic ties. New, more advanced forms of economic cooperation with foreign states have developed, corresponding to the present level of development of productive forces and meeting the requirements of the scientific and technological revolution (joint solution of fuel, raw materials, and energy problems with members of the Council of Mutual Economic Assistance (CMEA); shifting to long-term and large-scale cooperation with industrially developed capitalist countries).

The rapid development of the foreign economic ties of the USSR reflects the constant growth of the socialist national economy and is the result of the policy established by the Communist Party of the USSR on the use of the benefits of the international division of labor and the opportunity it affords to elevate the effectiveness of production.

Trade between the USSR and the countries of the CMEA has grown considerably (see Chapter 7 for more information on the CMEA). A new stage of economic and trade relations has begun with the capitalist industrially developed countries on the basis of equality and mutual benefits.

In the Soviet Union the plans for development of the economic ties with foreign countries are organically incorporated into the plans for the national economy. The foreign trade plans are conditioned by the major tasks determined for the national economy over a given period of time. The foreign trade relations plans must obtain that volume, product mix, and geographic direction of export and import that fulfills the needs of society to the largest degree, ensures high rates of economic development of the country, and increases effectiveness of social production.

The development of the most progressive branches of production and the

acceleration of technological progress are secured by imports of up-to-date machinery and equipment and of the most economical and progressive kinds of materials.

One of the most important tasks of the plans is determination of the proportions of our own production of some types of products and the volume of imports that results in the lowest national economic costs.

Our export plans must ensure the necessary foreign currency revenues to pay for the imported goods. At the same time, they must take into account the potential for production of commodities for export, in order to make the best use of production capacities, labor and natural resources both in industry and agriculture. They must be also coordinated with the plans and prospects for the development of industrial economic regions of the country. These plans should help to develop international cooperation in production and encourage effective forms of specialization in industry and agriculture.

ORGANIZATION OF FOREIGN TRADE IN THE USSR

ORGANIZATIONS ENGAGED IN FOREIGN TRADE OPERATIONS

In the USSR, all forms of foreign economic cooperation are implemented by organizations that have been granted the right to enter the foreign market on the basis of a state monopoly on foreign trade. The central organ of the state administration charged with the implementation of foreign trade is the Ministry of Foreign Trade. The greater part of operations with regard to the import and export of commodities is implemented through this ministry. State guidance over the special sphere of foreign economic relations of the Soviet Union involving assistance to other countries in their economic development is implemented by the State Committee of the Council of Ministers of the USSR for Foreign Economic Relations. Along with these two principal departments, a number of other organizations have the right to go to the foreign market, including the Tsentrosoyuz (commodity exchange operations of the consumers' cooperatives of the Soviet Union with consumers' cooperatives of other countries) and the Ministry of Trade of the USSR.

STRUCTURE AND FUNCTIONS OF THE PRINCIPAL ORGANIZATIONS ENGAGED IN FOREIGN TRADE OPERATIONS

The Ministry of Foreign Trade is organized into a number of administrations, each of which focuses on a particular area, of type of problem; thus, there are administrations for the various countries (as a rule, countries are grouped geographically), for the problems of the export and import of commodities, for the development of contracts, for planning, for financial analysis, for transportation of goods, and so on.

Foreign trade operations are directly implemented by specialized commercial organizations – the all-union foreign trade associations organizationally subordinate to the Ministry of Foreign Trade. The all-union foreign trade associations are independent business organizations, and they act as legal persons on the basis of statutes determining their legal position. A definite list of commodities that they are entitled to sell or buy is fixed for each association. Each association is organized further into specific product or commodity subgroups.

Associations conduct negotiations with foreign firms and foreign trade organizations concerning the purchase or sale of goods. They negotiate with them on the conditions and terms of deliveries, and on prices. They conclude the contracts and bear responsibility for their fulfillment. In cases of deviations from the conditions settled in the contracts, associations pay compensations to the foreign firms (in cases of exports) or submit claims to foreign suppliers (in cases of imports). Associations place orders for the export goods and secure the delivery of the import goods to the Soviet customers. They conduct all financial negotiations with the foreign importers and exporters through the International Bank for Foreign Trade – VNESHTORGBANK SSSR – as well as with the Soviet producers and customers.

The central management of the Ministry of Foreign Trade assures the implementation of the state trade policy, prepares the long-term agreements with different countries, reports yearly concerning their progress, checks the realization of commitments according to the agreements, and, in case of necessity, takes appropriate measures for their realization.

The State Committee on Foreign Economic Relations of the Council of Ministers of the USSR, which deals with the delivery of the equipment and materials for the projects built abroad with the technological assistance of the USSR, has a structure similar to that of the Ministry of Foreign Trade.

THE INTERRELATION OF THE FOREIGN TRADE ORGANIZATIONS AND INDUSTRY

The production of goods for export is the responsibility of industrial enterprises, which are subordinated to the ministries and departments. These enterprises and ministries and departments are not authorized to participate in foreign trade independently; they act through the Ministry of Foreign Trade and All-Union foreign trade associations.

Enterprises receive orders for the manufacture of products for export from the All-Union trade associations through the appropriate marketing organizations of the ministries and departments. All specifications for the manufacture of products for export and the terms of their delivery are agreed upon with the associations. The association indicates the country, the firm, and the address of the customer. All accounts for the goods shipped for export are settled by the enterprise with the association in rubles. Soviet customers also settle the accounts for equipment or goods imported for an enterprise with the associations in rubles.

The ministries have special administrations for foreign economic relations that organize the export work within their departments.

For deliveries of equipment for projects under construction abroad with the technical assistance of the Soviet Union, a ministry (general supplier) is appointed for each construction project. This ministry places orders for the necessary equipment with the enterprises of other ministries. It implements and bears responsibility for the deliveries and construction of the project abroad. However, the contracts and accounts with that particular country are managed by an association of the State Committee of the Council of Ministers of the USSR for Foreign Economic Relations (GKES).

All claims by buyers with regard to the quality of the products supplied for export are presented by the Ministry of Foreign Trade and the GKES to the industrial enterprises supplying the products. These enterprises have the duty to compensate the buyers for the losses and to pay forfeits in rubles.

All operations with regard to the shipment of export and import goods are carried out by transportation ministries – the Ministry of Railways, the Ministry of Marine Fleet, the Ministry of Civil Aviation – which settle all their accounts with the All-Union foreign trade associations as well.

THE PLANNING OF FOREIGN TRADE

The plans for development of foreign economic relations determine the tasks for all the organizations participating to a greater or lesser degree in export, import, and foreign currency operations. The planning of the development of foreign economic relations is carried out along two lines: (a) the nature of foreign trade operations (export; import; delivery of machinery and equipment for projects implemented abroad with the technical assistance of the Soviet Union; foreign currency, financial, and transport transactions) and (b) the type of organizations involved (Ministry of Foreign Trade, State Committee for Foreign Economic Relations).

At present, three independent but mutually interrelated plans are drawn up in the Soviet Union in the field of foreign economic relations:

The plan for export and import of commodities

The plan for the deliveries of equipment and materials for projects being built abroad with the technical assistance of the Soviet Union

The plan for foreign currency

The transportation and financial aspects of the plans for foreign economic relations are reflected in the appropriate sections of the national economic plan.

All these plans must be drawn up in such a way as to fix concrete tasks for each organization taking part in their fulfillment, and to provide it with an opportunity to control and answer for its fulfillment.

THE PLAN FOR EXPORT AND IMPORT OF COMMODITIES

The following main problems must be solved in the plan for import and export of commodities:

The volumes of foreign trade turnover, the rate of development of foreign trade, the directions of foreign trade as a whole and with regard to groups of countries

The volume and the items of trade with each country

Balancing of accounts with individual countries or groups of countries

Ensuring the fulfillment of obligations according to the agreements and protocols with different countries, signed beforehand

Determination of export resources, taking into account the possibilities of the national economy of the USSR and the necessities of the foreign market

Determination of import resources based on the needs of the national economy of the USSR, foreign currency resources, and the possibilities of the foreign market

Determination of the correct direction in the granting and obtaining of state, commercial, and other credits, taking into account the possibilities of their repayment in time both by the Soviet side and by the countries receiving credits from the USSR

Ensuring the most advantageous structure of export and import and its improvement, with the objective of raising the economic efficiency of foreign trade.

The plan of export and import of commodities consists of three sections:

Export and import by countries

Deliveries of commodities by industry for export

Deliveries of commodities to the national economy through import

The main initial data for the development of the *plans by countries* with those countries with which there are long-term trade agreements are contained in these agreements. The agreements, as a rule, offer general guidelines as to nature and quantity of goods to be exported from the USSR and imported into the USSR with a breakdown by year.

The volume and range of goods envisaged by long-term trade agreements are specified more precisely during the drawing-up of the annual plans of export and import of commodities, and there are annual protocols about mutual deliveries of merchandise.

In the plans for the foreign trade of the USSR, three main groups are differentiated: socialist countries, specifically among them the member countries of the CMEA; the developing countries; and the industrially developed capitalist countries.

The plans for development of foreign economic relations with socialist countries are aimed at further development of international production cooperation, at effective forms of specialization of industry and agriculture, and at mutually

advantageous unification of resources in order to develop individual industries to meet to the fullest these countries' needs for the products of these industries.

The plans for trade with the developing countries of Asia, Africa, and Latin America envisage development of stable foreign economic relations on conditions of mutual advantage with the Soviet Union. In addition, these plans are meant to strengthen their economic independence.

Expansion of economically justified foreign economic relations is envisaged with the industrially developed capitalist countries that show their readiness to develop cooperation with the Soviet Union.

Plans of delivery of goods for export must take into account the situation on the foreign market – the demand of foreign buyers for the products of Soviet industry; they must also be interrelated with the plans of the development of Soviet sectors of industry.

In working out draft national economic plans, priority expansion of production in those sectors of industry whose products are most effective in foreign trade must be identified. The necessary capital investments, material resources and monetary means must also be identified for this expansion. Production plans must provide for the manufacture of export goods whose production and transportation require lower investments and that are in great demand on the foreign market. They must also, for example, provide for expanding the assortment of the goods and include measures for the improvement of their quality, workmanship, and packaging. Measures must be taken to improve the pattern of export and to increase its foreign currency value. It is also necessary to take into account needs for further development of transport facilities to ensure timely shipments of export loads to the border points (ports) and an expansion of port facilities capable of processing export cargo expeditiously.

In plans for delivery of goods for export, definite tasks are set for each ministry and department concerned with the production of goods for export.

The import plans must envisage purchase of goods abroad, particularly equipment, that meets the present level of development of technology and is of high quality, tested in operational conditions.

One of the most important indicators necessary for the analysis and justification of the export–import plan is the economic effectiveness of foreign trade. Economic effectiveness of foreign trade is determined by comparing the expenditure for the production of export goods with the costs that the country would have had to bear if the imported goods (purchased with the foreign currency obtained from the exports) had been produced domestically.

THE PLAN FOR THE DELIVERIES OF EQUIPMENT AND MATERIALS FOR PROJECTS BUILT ABROAD WITH SOVIET TECHNICAL ASSISTANCE

The plan for deliveries of equipment and materials for projects built with materials and technical assistance from the Soviet Union determines the volumes and directions

of economic and technical assistance rendered by the Soviet Union to foreign states in the development of their economies. The plan includes deliveries of equipment and materials for the projects built abroad with Soviet technical assistance, technical aid (design and research work, training of national cadres, sending of Soviet specialists abroad to render free assistance to foreign states), and deliveries considered part of the contribution of the USSR to the UN budget.

The volumes of deliveries of equipment and materials and the volumes of deliveries of all kinds of technical aid are planned in the total amount and for individual countries. The plan also specifies the tasks for the ministries and departments for the manufacture of all kinds of products supervised by general contractors for export. The plans are based on the obligations stemming from intergovernmental agreements and requests by foreign customers for technical and economic assistance in the construction of industrial and other projects.

The plan determines the conditions under which technical assistance is rendered, either by the clearing method, for cash, or on credit. When determining credit deliveries, particular attention must be paid to the questions of credit repayment – when and how individual countries can pay back the credits obtained for the construction of projects.

SUMMARY FOREIGN CURRENCY PLAN

The foreign currency plan expresses foreign exchange operations arising as a result of the implementation of foreign trade and other forms of economic cooperation with foreign countries. Foreign exchange plans are drawn up on the basis of the plans for export and import of commodities; agreements on economic, technical, and cultural cooperation and on the development of tourism with foreign countries; and plans for international transportation and for other services.

The foreign currency plans envisage revenues and payments in foreign exchange in the course of the planned period. In developing foreign exchange plans, it is necessary to ensure that the balance of payments of our country is balanced and that necessary foreign currency reserves are built up.

The foreign currency plans are drawn up separately for three groups of foreign currencies:

Freely convertible currencies and clearings with free conversion
Closed foreign currencies and clearings with limited conversion
Accounts with the socialist countries

The revenues and payments with regard to all types of foreign exchange operations are planned in rubles. Calculation of the foreign currency of different countries into rubles is carried out in accordance with the official rate of the State Bank of the USSR valid at the moment of the compilation of the foreign currency plans.

The summary foreign currency plan consists of the following sections, which generalize the revenues and payments during the planned period:

Trade operations (commodities, trade, and overhead costs)
Services (transport and communications, technical and other kinds of assistance, insurance, tourism)
Nontrading operations (maintenance of establishments and representatives abroad, costs of business trips, dues for international organizations, bank transactions, and others)
Credits and property (granting and repayment of state, commercial, and bank credits, investments, purchase and sale of property, advance payments for future deliveries)
Free aid

On the basis of the deliveries and the payments enumerated in these five categories, the general credit balance for the yearly operation is determined.

PROCEDURE FOR DEVELOPMENT OF THE PLANS FOR THE FOREIGN ECONOMIC RELATIONS OF THE USSR

A great number of organizations, implementing foreign economic relations in one or another form, or connected with their implementation, take part in the formation of the plans for development of foreign economic relations. The work of all these organizations must be coordinated. As a result, the procedure for the development of the plan, and the terms and degree of participation of each department in the appropriate section of the plan are determined by the Gosplan of the USSR and are approved by the government.

On the basis of the drafts submitted by the Ministry of Foreign Trade, the State Committee of the Council of Ministers of the USSR for Foreign Economic Relations, and other organizations, the actual plans are worked out by the Gosplan and become valid after their approval by the government.

Formation of the draft long-range and annual plans for development of foreign economic relations of the USSR, just as of the entire national economy, is carried out in the following stages:

Development of the main directions (control figures) for the planned period by the Gosplan of the USSR
Development, in relation to these main directions, of draft plans by the ministries and departments participating in foreign trade operations
Development of a draft plan by the Gosplan of the USSR on the basis of the drafts submitted by the ministries and departments

The main problems of development of foreign economic relations must find

their solution at the first stage of the work on the plan, during the development of control figures (main directions). These problems include possible volumes of export and requirements for import of principal commodities; the volumes of foreign trade turnover and the rates of development of foreign trade; correlation between the rates of development of foreign trade and rates of growth of national income and industrial production; balancing of mutual accounts with different countries or groups of countries; changes in the structure of export and import; volumes of credits granted and received; provisions for the repayment of credits granted and received.

On the basis of the main directions, development of the ministry and department drafts for the plan begins. Starting from their existing obligations, the ministries and departments (general suppliers) determine the projects to be constructed abroad during the planned period and the requirements for equipment and materials for their construction. The Ministry of Foreign Trade and the State Committee of the Council of Ministers of the USSR for Foreign Economic Relations send information to the producing ministries and departments about the requirements for equipment and materials for the planned period, and these organizations, in their turn, inform the Ministry of Foreign Trade and the State Committee of the Council of Ministers of the USSR for Foreign Economic Relations about their conclusions with respect to these requests. The Ministry of Foreign Trade and the State Committee of the Council of Ministers of the USSR for Foreign Economic Relations, in their elaborations of the draft plans, take into account the conclusions of the departments, whereupon draft plans with the necessary justifications are submitted to the government and the Gosplan of the USSR.

In the course of the elaboration of the national economic plan, the Gosplan of the USSR harmonizes and interrelates the quantities of deliveries of equipment and materials envisaged for export with total resources and with the plans of industrial production.

Developed plans that detail the optimal use of material resources, export and import of goods, deliveries of equipment and material for projects that are built abroad with the assistance of the Soviet Union, and the foreign currency plan – coordinated with the draft of the plan of development of the national economy of the USSR – are submitted by the Gosplan of the USSR to the Council of Ministers of the USSR for consideration and approval.

ORGANIZATION OF CONTROL OVER THE FULFILLMENT OF THE PLANS

The approved plans for development of foreign economic relations have the force of law and are obligatory for the organizations whose tasks are set forth in them. These organizations are responsible for their fulfillment. This responsibility is established from "the bottom" to "the top," which means that each organization

is answerable to the organization to which it is administratively subordinated. For instance, a factory is responsible to a chief committee, a chief committee is responsible to a ministry, and a ministry is responsible to the government.

In order to organize control over the fulfillment of the plans, there is a system of periodic submission of reports about the progress of fulfillment of the plans. This system also works from "the bottom" to "the top." An enterprise submits reports to the ministry to which it is subordinated, the ministry submits a report to the general statistical administration of the USSR (TsSU) and the Gosplan of the USSR; the Gosplan of the USSR and the TsSU of the USSR report generalized data to the government. Problems in the progress of the fulfillment of the plan are considered at all the levels, and, when performance falls below planned levels, concrete measures for the accomplishment of the plan are worked out.

10 Improvement of Planning with Mathematical Methods and Computer Technology

V. N. Lisitsyn

National economic planning must be based on a study of social needs, on forecasts of economic feasibility, and on a complex analysis and evaluation of various planning decisions, all taking into account both their immediate and long-term consequences. Within the general problem of providing a sounder scientific basis for planning in the present stage of economic development, the following concrete tasks stand out:

Strengthening the purposeful character of planning
Ensuring an integrated approach to planning
Optimizing planning decisions
Improving the balance of plans

The indicated improvements in the process are being brought about by creation of a computer-aided planning system (ASPR) by the State Planning Committee (Gosplan) of the USSR, and by the Gosplans of the Union Republics. The difficulties of forming a theoretical basis for ASPR can be grasped if one considers the dynamic changes in the development of the national economy, the multiple factors in general state planning, and the complicated nature of internal and foreign relations that must be incorporated in the formulation of plans and their implementation. Because of this conceptual complexity, the basic principles of ASPR are still being developed. Also, the questions of the place of ASPR in the general statewide system of collection and processing of data and of its cooperation with numerous organs of planning and management of the national economy are still being worked out.

Practical experience in these matters is being accumulated and generalized. Experience so far permits an optimistic evaluation of the advantages expected from widespread introduction of mathematical methods and computer technology into

national economic planning. The fundamentally new possibilities for the storage and processing of data, which electronic computer technology has put at the disposal of man, provide remarkable opportunities for their utilization in planning work. Naturally, the first attempts to apply computers to planning problems were aimed at achieving a maximum effect – the optimization of planning.

As is widely known, mathematical optimization methods for individual planning tasks (the method of linear programming in particular) were developed even before the creation of computers. But only with the appearacne of computers did practical possibilities of applying these methods to planning arise. The stage was thus set for the construction of a more developed apparatus for modeling optimization planning tasks.

The first stage in the introduction of electronic computers into planning involved the broad utilization of mathematical–economic modeling in individual planning tasks – especially those where the potential effect of an optimal solution seemed to be greatest and about which there was little uncertainty. Many practical results have been achieved along this line that were of considerable national economic importance. Meanwhile, however, factors appeared that restricted both the practical utilization of mathematical–economic models in the planning process and the further automation of planning. They stemmed from the contradiction between the integrated, systematic character of the national planning process and the autonomous mode of solving specific planning tasks by means of computers; from the interrelatedness of planning problems and from the separation of the technology of the planning from the actual preparation of the plan.

Improvement of socialist planning is a continuing process inseparably linked with the development of the national economy. It embraces all aspects of planning: its methods, its organization, the availability of data, the technical methods of their processing, and more. Because of the interrelations among these aspects, improvement in any of them can be realized to its fullest extent only with an appropriate improvement in the others. This is the basis for a systems approach to the improvement of planning. Better means of processing economic planning information is only one aspect of this improvement. But, because of the system character of planning, utilization of computers in planning is inseparably connected with the development of other components: methods, organization, availability of planning data, and the like. Consequently, the total efficiency derived from computer-aided planning systems depends to a considerable extent on the coordination of the introduction of computers into the planning process with appropriate changes in other parts of the planning mechanism.

The practical difficulties encountered in the development and implementation of the first stage of automation in planning – the solution of individual planning tasks by means of computers – stemmed from the problems of such coordination. Thus, sometimes a model constructed for a definite planning task and theoretically more justified than existing methods, "did not fit" into the general system of planning calculations either because of inconsistency with the logic or technology in

other parts of the plan, or because of the absence of the information required by the model.

Moreover, experience showed that electronic computer technology was not always superior to human planners in operational flexibility. The automatic solution of planning problems on a computer requires a great amount of human labor in the collection and preparation of the initial data, sometimes amounting to 80–90 percent of the total time spent. The planners are thus burdened by additional work. Thus, one of the main advantages of computers – quick solution of problems using huge masses of data – has yet to be fully realized.

A further complication arises because the preparation and manipulation of data for the models have been largely separated from the planning process itself. And use by planners of models and solutions developed by others has not always been effective for several reasons. An important one is purely psychological. The planners, not having participated in the formulation of the model or in the calculations based on it, and observing that the data may not coincide with those utilized in their own calculations, frequently have a certain distrust of the results, even though they are optimal according to the model. After all, the responsibility for the result lies with planners and not with the model or the computer.

Second, preoccupation with the programming of computers for individual tasks has limited progress on the rational organization of programming and creation of effective means of its automation. This, in turn, has resulted in excessive difficulty and expenditure of time in the preparation of computer programs, and has limited the extension of easily accessible software to new areas. Considerable time thus elapses between the formulation of a problem and a practical computer solution. This has also slowed the automation of the planning process.

Thus, computer-aided solutions of some planning tasks has not, as a rule, changed the general technique for elaboration of a draft plan. Insufficient attention has been paid to the integration of the problems and methods at the various planning levels – national economy, industry, and regional levels – and data accumulation and computer technology itself are not used with adequate efficiency.

Elimination of these and other shortcomings in the use of computers is possible only if a systems approach is taken to the automation of the planning process. Therefore, systems that characterize the current policy toward improvement of planning by use of economic and mathematical methods prefigure the next natural stage in the application of the systems approach in this field. Before describing the approach to this stage we must emphasize that there is no implication that computers will no longer be used for solving separate planning tasks. The experience gained during the first stage has not only revealed difficulties hampering a wide-scale development of automation but also allows us to find those tasks that can be solved effectively in the autonomous mode. Thus, in the course of drawing up the Ninth Five-Year Plan, certain tasks of optimal planning were solved in 80 industries and production departments using computer technology. A typical planning task that can effectively be carried out automatically is the drawing up of an optimum

plan of shipments of enterprises. Automatic computation for a number of other laborious planning tasks is also done, although they are not connected with optimization models: centralized calculations for material resource requirements and intricate calculations of the plan with regard to labor and wages, among others. The transfer of these and some other planning calculations to computers, carried out at the Main Computing Center of the Gosplan, makes it possible to cut the time required by a factor of 6–10, even including the preparation of initial data.

Computer-aided solutions for individual planning problems have had a positive economic effect not only by allowing more rationalized planning tasks, but also through better forms and methods for collaboration of planners with the computer. From the point of view of the national economic goals, however, the nonsystemic, autonomous mode of automation is far inferior to the systemic automation of the entire planning process.

Technologically, automation of planning represents the totality of mutually interrelated means of methodological, information, technical, program, and organizational backup that permits the staff of the planning organization, in interaction with computers, to improve the fulfillment of its assigned functions. A principal distinguishing feature of such an automated system is that all these means, including the computer, are "built in" to the actual process of planning, and function as an integral part of it. This characteristic, naturally, places greater demands on the composition and complementarity of the backup means. But it also presents new possibilities for improvement of the planning work over that which is possible from the autonomous utilization of computers in an unintegrated and uncoordinated manner.

A characteristic feature of the systems regime of computer application, which distinguishes it from the autonomous solution of individual problems on computers, is the possibility for special-purpose computers and other technical facilities to carry out a number of functions for the collection, storage, processing and transmission of data, which up to now have been performed by the staff of the planning organ, and for the staff itself to concentrate more fully on the creative aspect of planning work.

One problem in the automation of planning is how to transform the planning work into a truly creative process. To achieve this one must free the planning staff from the burdensome technical tasks associated with the collection and preliminary processing of the primary data and many calculations of an auxiliary nature. Ideally, only the creative part of the planning process should be left for them to do – identification of the problem areas requiring a planning decision and the construction of a strategy or method for reaching a solution; determination of the methods and models for acquiring the data necessary for the planning decisions; assignment for computer processing of the appropriate sets of data and calculations; evaluation of alternative planning decisions and choice of the best of them when the planning process is simulated only partially.

The autonomous mode of the application of computers can ensure fulfillment of

only part of this great task. Handing some calculations over to the computer, for example, can take place only in the systems mode. Moreover, this must occur under conditions in which the data are easily available during the planning period.

Handing over to the computer a number of functions connected with creativity in the planning process is a very complicated job. It requires the solution of a great number of interrelated problems to perform planning in new conditions. These include the change of tasks, methods, and organization of the activity of a "living organism" – the working planning organ, which fulfills responsible functions in the system of national economic planning.

Experience shows that the most difficult step in the transition of planners to the systems mode of computer application is attaining reliable interaction with the machine, i.e., reaching such a stage of automation in the planning process that a planner can, without undue effort and at the appropriate time, utilize the computer's potential. The transition to the systems form of automation of planning and management was initiated on a statewide scale in the Eighth Five-Year Plan period of 1966–1970. Work on the creation of the automated systems of management (ASU) was included in that 5-year plan. During that period, over 400 automated systems were installed at enterprises and organizations, including machine-building, ferrous metallurgy, chemicals, and petro-chemicals, the coal-mining, power generation, transportation, construction, trade, and banking and finance.

Utilization of computers in the preparation of the 5-year plan for 1971–1975 was much greater than for the previous plan. Investments in computer systems were over five times greater, and, as a result, the number of newly installed systems increased almost sevenfold. The character and aim of their utilization changed as well.

During the eighth 5-year plan, automated systems were basically local in nature and were insufficiently connected with other systems methodologically, technically, and otherwise. In the Ninth Plan, besides the effective completion of the initial installation and utilization of automated data processing systems in all ministries and departments, a fundamentally new task is addressed. This is to subordinate each individual system to a single long-range objective. The projects of 1971–1975 for the development of automated systems provide the necessary conditions for making them parts of a single national system. The qualitative character of automation gradually changes as well. In the past, this occurred mainly in the type of solutions of specific problems of data processing. But in the present plan, automation extends to considerably more complicated problems, such as the optimization of planning decisions and resource balancing. This is facilitated by the accumulation of experience at the earlier stages of this work and by improvements in the techniques of mathematical–economic modeling. New methods of dynamic linear programming, graph theory, and systems analysis are becoming more widely applied in planning. And the technical level of the programming systems is improving, too.

Efforts to establish computer systems are presently being pursued at all levels and in all aspects of planning and management of the national economy. Careful

attention to orgainizational, methodological, and technical compatibility during their design and implementation will permit their synthesis into a nationwide system of automated data collection and processing for monitoring, planning, and managing the national economy. This system is known as OGAS, and its main function is planning of the national economy. Since planning is carried out on a nationwide scale, by a single coherent system of national economic planning, the automation of the planning process must also lead to a single, nationwide system of automated planning calculations. This system will become a functional part of OGAS.

This nationwide system of computer-aided planning calculations will have several subsystems. Each will apply to specific planning functions and have linkages to other levels and functions. Each can be organizationally separated from the others only to the extent permitted by the independence of the respective planning and management organs of the national economy.

The following types of computer-aided subsystems of planning calculations (ASPR) should become constituent parts of OGAS:

The computer-aided system of planning calculations of the Gosplan of the USSR and of the Gosplans of the union republics
Computer-aided systems of local planning organs
Subsystems of industrial branch planning
Subsystems of amalgamation planning
Subsystems for the automated planning of construction projects and enterprises

With the exception of the ASPR for the Gosplans and those for local planning organs, ASPRs are set up within the framework of computer systems for the specific ministries, departments, and enterprises. Organizationally, they are part of the appropriate automated system of management (ASU), and functionally they are part of OGAS. The emphasis given to ASPRs within the framework of OGAS makes it clear that they are the main links in the overall system.

Because planning factors are of common character and all ASPRs are intended to be synthesized into a single system, their separation within the framework of OGAS will serve as a basis for the realization of the principles of organizational, methodological unity of this system in practice. Separation of automated planning systems within the framework of OGAS will make it clear that ASPR is a main link of this system. Under socialism, it is planning that constitutes the central link of the national economic management, predetermining the role of other functions of management.

Research on the aims, possibilities, and methods of a computer-aided system of planning calculations began in 1966; full implementation of ASPR into planning is expected to have several stages. Individual elements of the system will be utilized as they are created. In particular, several components were used during the creation of the draft long-term national plan of the USSR for 1976–1990, as well as for the 5-year and annual plans.

Previous work on ASPR has resulted in significant contributions to its methodological, informational, program, and technical backup systems. For example, interindustry balances are being introduced into practice, as are methods for optimal planning of the development and distribution of industries and manufacturing facilities. Mathematical–economic solutions are used for problems of the planning of transportation, commodity turnover, foreign trade, and so on. Material balances among enterprises, material resources requirements for capital construction, and other calculations are now made with the aid of computers. Some work has also been done for the consolidation and coding of plan indices and documentation, and new computer programs have been created to expand the technical base of planning. All this is advanced work for the introduction of the ASPRs into service.

The various ministries, departments, and enterprises produce their own automated systems of management, which include planning subsystems. The statistical organizations are working to establish an "automatic system of governmental statistics," which will become an important component part of OGAS. Its creation is of considerable importance for the successful functioning and linkage of the ASPR with other automated systems within the framework of the OGAS. The critical role of statistics in the improvement of planning and management is widely appreciated, because adequate and reliable information for the planning organs, ministries, departments, and enterprises is essential. A single system of statistical information will also ensure the compatibility of the automated systems of all the organs of management of the national economy.

The tasks required for the creation of the automated systems of planning and management are gradually being completed. The masses of information from existing systems of management of production (ASUP) contain several million indices, and the computer programs utilized include over 100,000 instructions. At the level of the ministries, the number of these indices is over 100,000,000, and computer programs contain over 1,000,000 commands.

The existing automated systems have had considerable economic effect, thanks to their introduction at both enterprise and industry levels. In machine-building, for instance, automated systems contributed to an increase in the productivity of labor of 5–6 percent, to an increase in realized product of 2–3 percent, to a reduction in the need for raw material inputs of 2–4 percent, and to a 3-year or less payback period on capital expenditures.

In the Ninth Five-Year Plan period, only the foundations were laid for the coordination of all the automated systems of planning and management to be established; in the Tenth Five-Year Plan period (1976–1980), their practical integration into a single system has begun. This integration is being carried out both horizontally – linking the Gosplan, State Bank, State Committee for Supply, Central Statistical Administration, and All-Union ministries – and vertically, linking automated control systems of industries, amalgamations, and enterprises.

General prospects for the introduction and mutual interrelation of the computer-aided planning systems for the various national economic levels depend not only on

the program work for the creation of OGAS, but also on the rapid development of the technical base of automation and, most importantly, on the improvement in the design of computers and the growth of their manufacture. In the Ninth Five-year Plan period, mass production of third-generation computers, the "single computer system," created by the joint efforts of teams from Bulgaria, Hungary, the German Democratic Republic, Poland, the USSR, and Czechoslovakia, began. These machines are built in six different models, utilizing a single architecture and common systems of programming and compatible peripheral devices. The new machines provide wide opportunities for the development and linkage of automated systems, based upon the compatibility of the software of the computer models, which permits multiple technical facilities to be connected easily with one another.

It should be emphasized that the introduction of the computer-aided planning system, despite its sophistication, does not complete the work on the automation of the planning process. The process of improvement in planning is continuous. The tasks of planned guidance of the national economy become more complicated as scientific and technical progress produces new methods and more advanced technical means for their accomplishment. This determines the need for further development in the field of automated systems for planning.

It is still too early to discuss in detail the content of the work at the subsequent stages of automation. One can only trace the principal directions and trends of further development in the automated systems for planning. Some observations, however, can be made about the longer-term prospects of the development of computers in planning. Wide application of computer terminal devices and more intensive interaction between the planners and the computers are likely to occur. Also, the transition to a qualitatively new technology of joint processing of data in a "man–computer" dialogue should create new capabilities for the introduction of self-teaching methods in automated systems. The basis for such methods will likely be the recording in the computer of the previous interaction with the planner, statistical and formal logical analyses of those interactions by the computer, forecasting by means of computer programs, and display for the planner of statistically stable forecasts of his particular nonformalized, creative actions. In this way a computer would, in a sense, teach itself these actions, thus acquiring capabilities hitherto unique to man. One can imagine in the long run a gradual mutual adaptation of the staff of a planning organ and the computational complex, an even closer combination of creative, nonformalized actions of the planners with computer processing of data in a single technological process.

11 Cooperation between Planning and Management Organs in a Branch of Industry

B. Z. Milner and *N. A. Medvedev*

The success of our socialist economy is indivisibly linked with the planned management of the economy, and future economic achievements are closely dependent upon the quality of planning. This is why questions pertaining to perfecting the planning process, increasing the responsibility of personnel for fulfillment of state plans and targets, and strengthening of planning discipline in all units of the national economy remain the focus of our attention.

A better combination of centralized planning with broad economic initiatives by individual enterprises can be achieved by more intensive use of economic levers to stimulate the activity of the enterprises, and by a decrease in the number of quantitative plan targets fixed for the enterprise. These measures, along with a number of others, create favorable conditions for the development of initiatives by the production team and also free the higher organs (ministries and planning agencies) from duties of petty guardianship of the enterprises. Instead, they can concentrate their activity on the main problems of how to raise the scientific level of planning guidance. The effective development of initiatives in production collectives, the broadening of the various forms of direct contacts between individual enterprises, and the improvement of economic levers result in the further strengthening of management of the national economy by the government and in perfecting the forms and methods of centralized planning.

In recent years, there has been significant improvement in the field of industrial planning. Internal resources of any particular branch of industry are now more thoroughly considered in plans, requirements of scientific and technical progress are considered more effectively, and much is done to encourage the development and exchange of innovative ideas between different industries. Regional planning has shown improvement, complex economic plans of the union republics are being drawn up, and there has been a vigorous attempt to establish and maintain coordination between the planning of an industry and planning for the region.

For example, the timber and wood products industry has accumulated wide experience in developing forecasts, as well as in the preparation of general programs of development of that industry in coordination with the plans of individual regions and republics. In recent years, general programs of development for forestry have been made in the republics, economic districts, and provinces. Optimal programs for the flow of wood tonnage have been selected for the Volga basin, and a general long-range scheme of development of the timber and wood products industry, extending to the year 2000, has been prepared.

When planning for long-term development, it is undoubtedly very important to determine the optimal parameters of production capacities, to improve the range of specialization and industrial mix of enterprises. The optimal location of enterprises is also vitally significant.

Scientific and technical progress constitutes the foundation on which long-term development is built. It is obvious that knowledge of only the possible production volumes and their location among territories (i.e., how much and where to produce) is insufficient; it is necessary to estimate the technical and technological base for the production envisaged, how much expenditure would be involved, and what effect is to be expected.

The effect of scientific and technical progress is not confined to technoeconomic parameters of performance of a given industry or given enterprises. Equally significant is the social aspect: In what way does this progress help to accelerate the growth of the productivity of labor, and how does it improve the living conditions of the working people?

The most important consideration in making long-range industrial development plans is to recognize the need to bring about radical change in the structure of production and consumption on the basis of complex utilization of raw materials. All the efforts, starting with scientific search and ending with the construction and achievement of corresponding capacities, are geared to this aim. In this connection, in developing long-term plans it is of particular significance to analyze in detail the speed at which new "objects" would be constructed and the time needed to reach the projected capacities.

Methods of long-term planning are based upon the principle of optimality. This is achieved with the help of the latest methods of modeling – linear, nonlinear, and dynamic programming – with the aid of computer technology in planning calculations. The modern methods make it possible to determine correctly the national as well as regional proportions of the development of industry. In particular, such factors as the characteristics of the raw-material base, the intra-industry and regional capital intensity, and the material intensity and labor intensity of production are considered and analyzed, as are the estimates of transportation cost. The effect of sociopolitical conditions, the specific requirements for development of each region, the possibility and direction of technical progress, and many other related factors are also considered.

It is important that determination of the rate of development and the location

of a given industry take all factors into consideration. If the number of enterprises is great, the variety of products high, and the number of present or future customers large, then it simply would not be possible to optimize all the calculations pertaining to the given industry simultaneously and accomplish full regional specialization and cooperation. In view of this, each specific and interrelated question is considered step by step. The overall growth of production, for example, is determined at the higher level, and interindustrial and intra-industrial efficiency parameters are identified. Next, the optimal growth for each region of the country is determined. At this same stage, optimal specialization in production of each district is worked out, and the pattern for the most efficient flow of raw materials and products among districts is analyzed. After that, efforts are made to study the optimal location of production units within the regions, the degree of the concentration within the region, and other related matters. At the same stage, such questions as the advisable priority of development for each region and ways of answering intraregional needs are studied.

Long-term and current planning are closely related to each other. The perspective long-term plan serves as the base for construction of a current (annual) plan. However, it must be pointed out that the annual plan is not simply the summation of the annual component of the perspective plan. Newly revealed capacity for economic growth, the rise of productivity of labor, and new achievements in science and technology necessitate periodic corrections in the long-term plans prepared earlier. It thus becomes possible to review long-term plans at regular intervals on the basis of specific and more recent information.

At present, the management of individual industries consists of the ministry of that industry and the management units of amalgamations and individual enterprises. The industrial ministry is the central organ of state management, and it guides and has complete control over its industry within the national economy. Responsibilities and duties of ministries and of their organs are defined in the statute governing ministries of the USSR. Among these, one of the most important is the fulfillment of targets set under the state plan.

In each industrial ministry, there is a planning and economic management department that is the main planning unit of the industry. This department prepares a summary draft of the development plan of the industry on the basis of draft plans of enterprises and amalgamations. It is also responsible for keeping enterprises and amalgamations informed about the final plan targets for the established indices.

There are similar planning subdivisions in the management structure of enterprises and amalgamations. Here it should be emphasized that the planning and economic department in ministries and the planning and economic section of enterprises are not the only planning machinery for the respective industry or enterprise. One of the main tasks of the system is coordination and the direct involvement in the process of planning of those whose duty it is to guide and supervise the implementation of the plan in the various divisions of ministries

and enterprises. Coordination with the managers is achieved by specifying a certain procedure for cooperation between the units for planning and for management when the higher organs (the ministry and its planning and economic directorate) fix specific timing and steps in the preparation and coordination of plan targets. The planning organs of enterprises and amalgamations similarly define the deadlines for preparation of each part of the plan by the respective management divisions of these enterprises. Coordination of function in preparation of the plan by the planning units is also achieved by organizing and regulating the flow of information to and from each of the divisions, and by balancing the qualitative indicators of various parts of the plan.

Planned management of the national economy is based upon Lenin's principle of democratic centralism. The achievement of production plans depends greatly upon the creative activity of the masses. Hence, workmen, collective-farm workers, engineering and technical personnel, and office workers all take part in the discussion of the development plans of the enterprises in meetings called for the evaluation of production activity and related matters. They contribute many valuable suggestions that help reveal and identify changes that could profitably be made to increase and improve production.

The following sequence is followed in making and confirming the long-term and annual plans. First, the principal directions of development for the national economy are defined. These include determination of plan targets in terms of volume of production, investments, productivity of labor, cost of production of output, and a host of other important indices that apply to the aggregate economy. Thereafter, these targets are transmitted to each enterprise through the management staff of each industry in the form of planned figures (targets).

Analysis of the plan targets and the subsequent construction of draft plans start at the level of the individual industrial enterprise. Draft plans for the enterprises, prepared with consideration for the maximum utilization of productive resources and with maximum efficiency, are passed to the industrial amalgamations. These organizations study the plans of the individual enterprises; combine and integrate these plans, giving consideration to economic ties with other districts; and prepare summary drafts of the long-term plans that are then forwarded for review to the ministry. Summary drafts of the long-term plans of the industry are then prepared and presented by the ministry to the Gosplan.

Initial efforts to formulate and prepare the *annual* plans at the enterprises must begin approximately 9 months before the start of the plan year. Preparation of annual plans is done in three stages.

The *first stage* (by May 1) involves preparation of initial proposals by the enterprises, encompassing volume of production and sales of products and services in physical and monetary terms. The volume of essential material and technical inputs are also delineated at this stage.

Proposals by the enterprises consist of three parts or alternatives:

1. Projected production with existing capacities – i.e., assuming that centralized material and technical supplies remain at the same level as in the current year
2. Projected additional production, mainly with the existing plant capacity (taking into account capacity expanded by the resources of the enterprise), and with an increase in centralized material and technical supplies to the enterprise
3. Additional production resulting from centralized investments and additional supplies of inputs

At the *second stage* (about September 1) an attempt is made to prepare a coherent draft of the plan after the proposals of the enterprises have been examined and reviewed by the higher organizations. The draft plan is then presented to the higher organization in final form.

At the *third stage*, after the approved targets of the state plan have been received, efforts are directed to preparation of the production plan, with required format and a detailed specification of all indices of volume of production, type of products, range of products, quality of goods, and other economic indicators.

In preparing the development plan, the enterprise must bear in mind the following guidelines: maintenance of regular increases in the volume of output essential to the national economy (including the volume produced for export purposes); fulfillment of targets set in the state plan; sustained general rise in the efficiency of production; increases in dependability and quality of the products being manufactured; and improvement of working and living conditions of employees of the enterprise.

In preparing the development plan, enterprises engage in the entire spectrum of planning and economic work. Reflecting the demand of consumers, economic agreements, and targets set by the planning bodies, the types and varieties of manufactured goods are specified. Particular attention is paid to increasing the quality of consumer goods. Careful analyses are carried out of production and economic performance for the preceding period, the level of mechanization and effectiveness of technology being used, the organization of production, and the degree of specialization of production units. In addition, measures to eliminate existing weaknesses in the production process, increase the production of essential consumer goods, decrease the cost of production, and increase efficiency are assessed. Also reviewed are suggestions for specializing in the production of certain types of goods, for cooperating with other manufacturers, and for establishing direct links with consumers. Studies are made on how to accomplish the rate of utilization of advanced equipment brought about by technological progress. Similarly, the rate of utilization of materials, fuel, energy, labor, and other resources is analyzed. Suggestions from employees of the enterprise for improving the organization of production, operational planning, and the system of material incentives are studied and discussed.

The division of the annual plan targets for production among the quarters of

the year is influenced by many factors: among them are time of delivery of products to users, which is fixed by the higher planning organizations and decided by mutual agreement between producer and user; increase in output through more effective use of production facilities and basic funds; scheduled installation of new capacity and equipment; balanced production assignments and a rhythmic pace of work of all the production units of the enterprise; number of work days in each quarter; possible influence of seasonal variations on production conditions and user needs; and breakdowns and maintenance schedules.

The technical production and finance plan of the enterprise is formed on the basis of all relevant indices, by quarter. This plan is reviewed by the standing production committee, must be approved by the director of the enterprise, and, thereafter, is sent to the higher planning organization for checking.

On the basis of the technical production and finance plan, the planning section of the enterprise sets annual and quarterly targets for the individual shops, and also establishes operational targets for shorter periods, e.g., for 10-day periods or for each day.

The higher organization sets for the enterprise the following plan targets or indicators:

For production The total volume of sales valued at existing wholesale prices for the enterprise; the physical volume for each of the major products, with separate indication for quantity earmarked for export; and indicators of the quality of the products and targets for the development of new products.

For labor Specific targets for growth of the productivity of labor (output per worker) and the amount of the total wage fund.

Financial targets Values for total profits; profitability (the ratio of profit to the sum total of basic production funds and working funds); payments to the national budget; appropriations from the budget; the funds for economic incentives.

Investments in capital construction The volume of centralized and noncentralized investment; introduction of basic funds and production capacities.

For introduction of new technology Targets are established for enterprises for development of new products, introduction of new technological processes, and further mechanization and automation of production, especially that of particular significance for development of that industry.

For material and technical supplies The volumes of raw materials, equipment, and other inputs to the enterprise, distributed by the higher planning organization.

Plan targets and indices other than those discussed above do not require the approval of higher organizations and are set by the enterprises themselves. In setting plan indices, the enterprise is guided by norms fixed by ministries or amalgamations (these norms remain stable over a number of years): the norm for payment for the use of principal production funds and rated working funds;

the share of profit allocated to the fund for material incentive; and the amount of the appropriation to the fund for the social, cultural, and housing needs of the people; the fund for development of the enterprise.

Before initiating the production plan at enterprises, it is essential to determine the demand for the goods to be produced. A very important section of the plan covers the determination of needs of material resources, which is done on the basis of input coefficients, or the required materials per unit of the product. These calculations are based on the most favorable coefficient of material inputs attained by the more advanced enterprises. Operational production planning is an extension of technical production and financial planning at the enterprise.

Cooperation between the agencies of planning and the agencies of management is not limited to preparation and determination of plan targets. Of equal significance for effective production is organization and supervision for the implementation of the plan. The main criterion for evaluating the performance of ministries, amalgamations, and enterprises is their performance against the plan targets and indices. Therefore, during the implementation of plans, the planning units monitor, supervise, and analyze progress in accomplishing the plan targets. They participate in the evaluation of prospective decisions on technological and organizational changes and develop methods of economic and material incentives for the increase of production efficiency. By doing so, they provide the organs of management with the information essential to effective decisions geared to implementing the plan.

12 Interaction between Organs of Administration and Planning in a Large Region

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Regional management addresses the problems of the national economy as they arise in a limited geographic area. It deals, in a broad sense, with the productive activity located within a given geographic area. There are several aspects of regional planning and management.

First, regional management seeks to contribute to the solution of such problems of the national economy as raising the rate of development in the peripheral regions and the eastern regions of the country and eliminating the energy deficit of the European part of the USSR. In most cases, the tasks of regional management are socioeconomic in nature.

Second, regional management sometimes solves problems connected with individual industries. This happens when the objective of the industry plan, because of certain specific technological or organizational factors in the industry, occurs exclusively in the specific region. The management of the production subdivisions of an industry (enterprises, amalgamations, plants) takes place within the limits of a specific territory. The regional principle, for example, dominates the planning and management of forestry and agriculture, of railroad transportation, and of some other industries.

Finally, regional management solves local problems. These problems are rather complex in terms of their content (economic, social) and their object (industry, service). One may identify the following specific types of regions:

Old, stabilized regions with well-formed industry structures. In these cases the major problem is the growth and intensification of production.

Old and stabilized regions, well under control but where new industries are developing; for example, the region of the Kursk magnetic anomaly, the oil deposits in Byelorussia, the resort zone in Ostashkovo.

Newly developing regions, with negligible economy, infrastructure, and

population, or regions that undergo a change in their production and economic structure, such as the virgin lands, the region of oil and natural gas concentrations in Tyumen, or the hydroelectric station (GES in Russian) at Bratsk.

At the level of the national economy, regional management and planning is accomplished by the central and interindustry (functional) planning organizations of the Council of Ministers of the USSR – the Gosplan, the Gossnab, the State Committee on Labor and Social Issues and others. These organizations ensure that the appropriate regional approach is taken to the solution of national economic problems during the preparation of plans for future development of the national economy and for organization of current management.

A characteristic feature of socialist production is that the basic regional problems are solved at the level of the national economy in order to reflect national economic interests while also taking into account local interests and conditions.

On the sectoral level, regional management is accomplished in different ways. In several industries (construction, transport, agriculture), there is a system of regional organs. For example, the Ministry of Construction manages the component building-assembly enterprises by means of a system of regional production committees and republic ministries. These regional organs direct industrial and community construction in a designated territory. On the other hand, the management of agricultural production is carried out by regional organs within the Ministry of Agriculture of the USSR. Regional agricultural organs are formed on the basis of corresponding local administrative organs of general authority – provincial and regional executive committees of councils of people's deputies.

At the level of administrative regions, regional management is the function of various organizations, namely, of the local party and soviet organs.

Management and planning for the region is interrelated with activities at various levels. In the next section, the process and procedures in the interaction among the various organs of management and planning within a region will be treated. In other words, we shall analyze the regional level of regional management.

THE PROBLEM OF INTERACTION BETWEEN ORGANIZATIONS FOR MANAGEMENT AND PLANNING IN A REGION

A central problem in improving the management of the national economy at its present stage of development is to achieve an optimal combination of industrial and regional involvement in the management of national production.

The management of the national economy is basically organized according to industries. This organization of the managerial system satisfies most of the demands of modern production and facilitates the fastest implementation of the achievements of the scientific–technological revolution and the application of a unified technological policy.

One of the ways of securing the rational combination of the two approaches to management and planning of the national economy is through precise coordination of the planning and management activities of all organs within the territory of a given region. To achieve maximum impact on the national economy requires the organized coordination of various organs of economic management in the region. The socialist method of production provides the necessary conditions for the organization of such cooperation.

The leading role in organizing the interaction of central (republic), industry, and interindustry (functional) organs with the regional management organs belongs at the center. According to principles of democratic centralism, the center determines the authority of the various organs at the regional level and also determines their hierarchy and interaction with other organs. The councils of people's deputies, under the leadership of regional party organizations, organize the interaction among planning and management organs.

One must note, however, that the roles of the councils of people's deputies, in determining the interrelations of various managerial organs, are not all the same. The relations between the councils of people's deputies and enterprises within their territory that emerge in the process of management and planning of the economy of the region can be divided into three basic types: subordination, coordination, and recommendation. The type of interrelation in any instance depends on the nature of the subject of the interrelation. Several dimensions can be singled out:

The level of the subdivision: territory (kraj), autonomous republic, city, zone, village

Sector: industry, agriculture, construction, transportation, communication, service

Branch of industry: machinery, light industry, food industry, local industry, and so on

Production elements: production (main production, auxiliary production, and production of consumer goods), technological progress, management techniques, automated systems of management

The functions of management: forecasting, planning, motivation, accounting, control, for example

Aspects: e.g., economic, social, national, organizational, technical

Phase of production: capital construction, supply, production, marketing, finance

These dimensions of the planning process permit a more precise description of the interaction and jurisdiction of managerial organs in the region.

In establishing the relations among the various levels of management, several fundamental questions must be answered: At which level of the management system do local bodies make decisions? In which situations and in connection with what problems do local bodies coordinate their decisions with those of other

management bodies? And on which issues is their role limited to an advisory activity in making recommendations?

The objectives of regional management bodies are diverse and depend on, among other things, the level of the local organization (e.g., autonomous Soviet Socialist Republic, region, district), on the size of the territory, on the proportion of national and local enterprises and organizations located in this region, and on the place the region occupies in the system of the national economy.

One can single out as a basic axiom of regional management the overall development of the regional economy with the most effective possible use of human and natural resources. Overall regional development implies that the maximum national economic effectiveness be secured, along with consideration of local interests and peculiarities. Sometimes industrial ministries at the national level do not consider the interests and local conditions of a particular region because of lack of information or other legitimate reasons. The ministries within a region also quite often act separately, especially in establishing new enterprises. They, too, may not fully consider the impact of their decisions on the rational planning of cities, for example.

The issues related to the interrelation of the regional managerial bodies can be divided into two broad groups. The first concerns the managerial body (of amalgamations, enterprises, organizations) being doubly subordinated. For example, a local industry section of the executive committee in a region is, on the one hand, subordinated to the *regional* Council of People's Deputies and on the other to the corresponding ministry of the *republic*. The activity of the regional executive committee will thus be divided into a group of problems solved independently by the regional executive committee, and a group of problems demanding coordination with the sectoral ministries. The system of double subordination, when the functions of management are precisely separated, permits integration of the interests of overall regional development with the interests of the branch of industry.

The second group of issues concerns the relations of the managerial organs in the region with organs not subordinated to regional authorities. These are enterprises that are subordinated to the ministries at the union level and some that are subordinated to organs at the republic level. The creation of industry and production amalgamations involves a further step toward perfection of the management of the national economy, bringing even closer the interests of industrial and regional managerial organs and facilitating the more effective interaction of various managerial organs within the limits of a single region.

An important ingredient in the interaction among the managerial organs within a region is the democratic nature of regional managerial organs and their intensive focus on social problems, improvement of the living standard, and the protection of the environment of the region. The councils of people's deputies attract large numbers of workers, collective-farm workers, and intelligentsia and involve them in the management of the national economy.

The regional managerial organs are directly involved in providing living quarters and everyday community services for the population. The local councils are

responsible for the development of the infrastructure of the region and for developing the cities and other settlements according to the plan.

The role of the councils of people's deputies has been emphasized in the synchronization, unification, and coordination of activities of numerous regional managerial organs. This is quite natural, since these councils are responsible to a great degree for coordination of the activity of numerous managerial organs in a given region. But *regional managerial organ* is a broader term, including labor unions, the komsomol organization, collective-farm unions, scientific–technological societies, and other social organizations.

A special leadership position in the interaction among managerial organs in a region belongs to the party organs. This role is determined by the status of the CPSU, of which it is stated that the party "is the highest form of socio-political organization; the leading and directing force in the Soviet society. The party directs the great constructive activity of the Soviet people and contributes organization, planning, and scientifically sound characteristics to the struggle of the Soviet nation for its achievement of the final goal – the victory of Communism."* Party organs devote much attention to the problems related to the organization and management of the national economy, but they do not replace the state and other economic managerial organs.

The leadership of the party in organizing the management of a region has two basic aspects. First, the leading party organs in autonomous republics, regions, cities, and districts direct all the party organizations in enterprises and institutions located there. The party organs control the fulfillment of the state tasks by the amalgamations, enterprises, and institutions. They actively participate in implementing personnel policy, prepare jointly with state and public organs proposals dealing with improving the production and social structure of the region, and submit them to higher party or government organs. Second, the party organs exercise direct influence on regional management through the party groups in local councils of people's deputies.

The industry approach to management of the national economy demands considerable centralization of all managerial functions. Democratic centralization, however, requires a guarantee of all the rights and initiative of enterprises, amalgamations, and regional organs. Industry centralization without active participation of regional organs in some cases leads to decisions that are less effective from the viewpoint of the national economy.

For example, in the city of Gorky, several industry ministries have their own educational institutions, which aim to raise the qualifications of directors of enterprises through courses in management and leadership. Naturally, the curricula of these institutions, while differing somewhat to reflect characteristics of a particular industry, are for the most part identical. But as unionwide industry ministries must organize such educational centers in a number of cities, there is a decentralization

* *The Rules of the CPSU*. Moscow: Political Literature Publishers, 1971, p. 4.

of the resources and personnel used in the management training process. In Gorky, there are several branch educational institutions, but none with a proper financial and staff base. This situation suggests that a reasonable solution may be to centralize management education within the city (region) in one sufficiently large educational institution with a *regional* responsibility (for example, under the Gorky party committee or under the city executive committee). This would involve a *regional* concentration of this managerial function (education of managerial staff) that would be more efficient than the industry concentration that now exists.

The interaction of various managerial organizations within a region is obviously a regional version of the interbranch approach to coordination of planning. If strengthening the interbranch approach is desirable on grounds of growth of production efficiency under the scientific and technological revolution, then a similar strengthening of interaction of regional managerial organizations and of the role of local bodies as the organizers of this interaction is also desirable. The horizontal centralization (or concentration) of functions that takes place under the territorial approach does not contradict or diminish the vertical centralization of managerial functions; rather, it supplements and, in a certain sense, strengthens it. Observance of the principle of democratic centralism in management for the national economy demands unconditional adherence to the decisions of central organs. These decisions are reached after consideration of the needs of lower-level units in the managerial hierarchy. They also allow a considerable amount of initiative to local regional organs for their own activities.

The interaction among regional managerial organs is exceptionally complex, for a number of reasons. First, there are a multitude of regional managerial units, of which one group is subordinate to regional decisions only, a second is under "double subordination," and a third is exclusively subordinated to union (national) organs. Second, the present administrative division, which determines the sphere of influence of managerial organs, no longer fully corresponds to the real economic segmentation of the country. For this reason, a number of regional economic complexes are subdivided between administrative units (for example, the schist region of Kokhtla-Yarve). Third, there are differences in branch and regional approaches to management.

Branch management is charged with securing the highest *national* production of a definite type of output at minimum cost. The *regional* managerial organizations seek to develop *all* the aspects of the *local economy* in an efficient way. For the national economy, these two tasks must coincide, since they are not different tasks but rather two different approaches to the same task – that of raising the effectiveness of social production.

Experience, however, offers examples of contradictions between the interests of branch management and the interests of regional management. For example, there are cases when branch ministries, trying to fulfill plan tasks, are profligate with natural resources and violate the rules of environmental preservation established by the legislature of the USSR. In the Irkutsk region, the yearly increase in timber

production is 60 million cubic meters if logging is correctly controlled. This is sufficient to fulfill the plans of timber-purchasing organizations located in the region. However, the timber cutters, attempting to ease their task, cut the timber in accessible locations; because of the increase of logging in such regions, the upper reaches of the rivers Belaya, Kutaj, and Irkut are deforested and soil erosion is occurring.

In this region large investments were made with the assistance of a number of ministries, with regional managerial organs coordinating the effort to improve the situation. The precisely organized interaction of the managerial bodies on the regional level is one of the avenues for further improvement of the effectiveness of socialist production management.

ORGANIZATION OF INTERACTION OF TERRITORIAL MANAGERIAL ORGANS

Complex plans are prepared to ensure the effectiveness of interrelated development of production in a given territory. In every independent territory the problems of population distribution, transport, housing, culture, education, and health are examined by all organs involved. The interaction of various managerial organs is organized according to the overall project of planning and construction of the city. Thus, the development plan of a city incorporates indicators of infrastructure development, housing, social services, land-use, and environmental protection. Such planning problems are solved for the entire city no matter what department the planning development projects fall under.

Investment programs by industries connected with the creation of regional production complexes are coordinated, usually by a body that serves as the major customer and has the necessary resources. The basic guiding documents for managerial organs in their activities related to the development of the region are (a) the scheme of regional planning, (b) the complex long-term plans for development of production complexes in the region, and (c) the plan for social development of the region.

In accordance with existing legislation, the general direction of economic activities under local control is done by the councils of people's deputies. These councils also coordinate the activities of enterprises supervised by the union and the republics.

In many regions, there are enterprises or amalgamations subordinate to the union or republics. The role of these enterprises in the development of the region normally consists only of partial participation in the construction of the city and in the creation of infrastructure. During this process, most of these enterprises under unionwide ministries (e.g., machinery, chemicals) coordinate their activities on community problems with the executive committee of local councils. Only the agricultural enterprises that are under double subordination maintain a close connection and coordination of all their activities with regional managerial organs.

The plans for the national economy approved by the councils of ministers of

autonomous republics (or local councils) serve as guides to the enterprises and organizations subordinate to them. The legal and economic responsibility of local regional managerial organs allows them, during each stage of planning and organizing production, to influence the economic and cultural development of the enterprises under local control, as well as to make timely decisions to ensure the fulfillment of the objectives.

The means available to regional organs for influencing the enterprises under union and republic control are totally different. As a rule, local influence is actively brought to bear only in the process of long-term planning. This is achieved by participation in discussions related to the problems of location of new facilities, by the study and examination of the most important decisions to be taken by enterprises under union and republic control and coordination of these decisions with the plans for regional development, and by study of the tasks for the production of consumer goods.

At the stage of preplan justification of prospects for the development and perspective planning of the regional economy, all main managerial organs carry out a number of important functions by taking part in working out proposals that in the end concern the plan for the national economy. This makes it possible to take into account more carefully the needs of each given region and its population.

The mechanism of interrelation between local councils and enterprises under union control can be described as follows: The enterprises take part in the creation of financial and material-technological resources and contribute to the development of regional infrastructure and to increases in the living standard of the population. The task of the local councils is to coordinate the efforts of all enterprises with a view to solution of regional problems. Such a scheme is best adapted to regions where the interrelated industries belonging to various ministries are concentrated in large cities and in compact industrial centers.

The problems of regional development can be successfully solved only by coordination and balancing of the interests of industry and agriculture. An important matter for coordination in this case is the planning of the effective use of land. The choice of an appropriate building site for an industrial project is obviously influenced by whether the land is suitable for agricultural production. Another matter requiring coordination of the interests of industry and agriculture is the social and economic impact of urban settlements on the development of rural areas.

The problem of jurisdiction and authority in regional managerial organs is solved at each stage of socialist construction in accordance with the political and economic tasks and stages of development of the country. Recent legislation has broadened the authority of city, district, and rural councils of people's deputies in the planning and coordination of the activities of organizations subordinate to different departments and located within a given territory. The regional managerial organs have been granted full authority in managing, for example, land utilization in the region. The authority of the regional executive committee has also been strengthened by the fact that, whatever the departmental or ministerial domain of the land user, it is

the executive committee that makes comprehensive decisions on land use, water supply, road construction, and location of settlements when the general plan for the region is prepared. The regional executive committees also resolve conflicts concerning land problems among enterprises and regional organizations.

INTERACTION BETWEEN ORGANS IN THE PROCESS OF PLANNING

Throughout the history of socialist national economic planning, the interrelation between the industry and regional planning has changed, reflecting the socioeconomic conditions of the times. Characteristic of the present stage is a search for forms of combination of the industry and regional aspects of planning and management of the national economy that can most effectively raise the efficiency of production and increase the intensification of production in order to raise the standard of living.

The main means of coordination of the industry and regional plans is the elaboration of complex plans. The Gosplan of a union republic works out complex plans for the territory of the republic and its economic regions, taken in their entirety, regardless of departmental subordination. Complex plans are also worked out for regions. In these plans, regional planning is accomplished, starting with the objectives of the republic and of each region, all within the framework of the all-union territorial division of labor. This means that consistency among plans on different levels is ensured.

The economic necessity for coordination of the regional and industry plans arises from the fact that planning in the cross section of an industry seeks to implement a single technical policy. It determines the items and volumes to be produced, as necessary for the national economy. But industry plans do not reflect such indicators as the availability and efficiency of utilization of resources – labor, power, water, land, and other resources of the given territory – the standard of living of the population, the necessary division of labor between individual regions, national income, and some other indicators that are necessary to proportional national economic development.

Only with harmonization of the industry and regional plans can the optimal structure of the economy of a republic (region, province) be determined, along with the required rates and structure of its development. Therefore, the ministries and departments work out, in conjunction with the planning organs of the republic, regional cross sections of branch plans separate from the plan for the industry as a whole. For this purpose, Gosplans of the republics work out the value, labor, and material balances: availability of labor resources; productive capacities of the construction organizations; availability of power, fuel, mineral fertilzers, building materials; and so on. To reflect the problem of raising the material standard of

living of the population, balances of monetary incomes and expenditures of the population are also worked out. They serve as a basis for appropriate distribution of goods among the different territories.

The territorial cross section of the industry plan is insufficient, however, to manage all aspects of the development of a complex economy of a large country. In particular, it is also necessary to work out interindustry proportions by region. This is necessary to ensure efficient utilization of regional resources of multipurpose use and to gradually eliminate interregional differences in levels of economic development and utilize all the advantages inherent in the territorial divison of labor. These problems must be addressed through complex regional planning.

Three main forms of forecasting and planning within the framework of the regional integrated approach are used in the USSR:

Long-range projections of the development and distribution of productive forces as preplan justifications

Regional plans (plan for industrial areas and agricultural regions) and general plans for cities

Plans for complex development of the economy of the republics and other regions

Each of these forms of regional integrated forecasting and planning has its own structure and purpose. Projections of the development and distribution of productive forces are worked out in cross section for the union republics, major economic regions, and administrative regions. They normally cover large-scale projects calculated for a long-term perspective. They provide justification for the possibilities and prospects of the development of the economy of all the regions, taking into consideration natural resources, projected growth of the population and labor force, expected investments in new construction, development of new territories, and exploitation of natural resources. These forecasts, however, do not contain directive tasks addressed to specific departments. They do not have operational significance for economic activity. They form the scientific basis of the program of development, and their recommendations should be embodied in the plans that have a directive character.

Long-range planning projects for key industrial areas and agricultural regions also have an indicative character. Unlike the schemes of the development and distribution of productive forces, they work out in greater detail the prospects for the development of particular subregional economic complexes, such as the Pavlograd, Torez-Snezhnjansk, Cherkassy, Ivano-Frankovsk, Karolino-Bugaz, and others comlexes in the Ukraine, South Tadjik complex in Tadjikistan, the Navoi complex in Uzbekistan, the Aldan-Shul'man-Udokan complex in Yakutia, and the Sayanskiy complex in the Krasnoyarsk territory.

Regional planning covers projections of longer term rational development and the construction of production units, new roads, and settlements. It also determines

the type and the location of industrial construction and provides for community services. It considers problems of rational regional organization of production in close interrelation with the development of the productive and social infrastructure, mobilization of regional resources of multipurpose use, and, finally, formation of an integrated settlement system.

The data developed in the long-term forecasts of development and distribution of the productive forces and regional planning objectives are taken into account in the 5-year and long-range plans for development of the national economy. Directives are given to the appropriate ministries and departments, republics, and local soviets, and necessary material and financial resources are allotted.

The directive approach to the formulation and adoption of integrated regional solutions in a union republic is based mainly on the compilation of the plans for the integrated development of economic and administrative regions. These plans, as already noted, cover the entire economy of the region, regardless of the formal line of reporting and control. These are briefly termed "complex territorial plans." This is a relatively new integrated form, developed especially after the 24th Congress of the CPSU. Earlier, the main summary indicators of the national plan, irrespective of the line of control, were worked out at the level of the union republics. They included the gross product of the republic and its distribution among the various manufacturing industries, income and distribution for investment and consumption, and objects of investment.

In the ninth 5-year plan, the first steps were taken toward creation of a single system of complex plans for different hierarchical regional levels: union republics, economic areas, regions, low-level administrative districts, and towns. The role of the regional organs of management and planning in solving interindustry problems in the region has increased substantially.

The different cross sections of the national economic plan raise questions about their effective interaction, coordination between industry and regional organs of management, and the rational distribution of rights and responsibilities for the attainment of the common aim – increased efficiency and higher standard of living for the entire population. A plan can be effective only if it is an obligatory program of definite production and economic systems. Each plan and its components must be addressed to a certain body, and appropriate management organs should be responsible for its fulfillment. Regional plans must have a definite prospect of influencing the activities of the enterprises, some of which may be under central ministry direction.

How are the questions of cooperation between regional and industry organs of management currently solved?

Development of a long-range plan consists of three stages: preplanning, preliminary, and final. At the preplanning stage, the necessary documentation of methodology for the planning process is worked out, and scientific forecasts are made. Already at this stage, the forecasting efforts of research organizations of different types, including industry and regional institutions, are united. The most important

documents at this stage are forecasts of the growth and distribution of the productive forces, developed at the resource, industry, and regional levels.

After preparation of the forecasts, the process of planning proper begins. At the preliminary stage, elaboration of the main dimensions for development of the national economy in the long term is accomplished. The main task is to work out the conception of the plan and to combine the results of careful studies of social needs, scientific forecasts about the existing resources, and possibilities of economic growth into coherent and feasible long-term targets. Ministries and departments, as well as Gosplans of the union republics, take an active part in developing the concept of the national plan, together with the Gosplan of the USSR. At the same time, the central planning organs maintain close contact not only with the ministries and republican Gosplans, but also with research institutes. It is at this stage that there is an opportunity for incorporating as fully as possible proposals from the union republics and ministries. The proposal is then submitted to the Government of the USSR for its consideration.

After approval of this document, the Gosplan of the USSR chooses a comparatively limited range of the most important indicators as guidelines for the ministries and Gosplans of the union republics. In their turn, the ministries assign the so-called control figures to the enterprises, and Gosplans of the union republics assign these control figures to the economic organs subordinated to them and the regional planning commissions.

From this moment the final stage of planning begins, namely, elaboration of a draft plan. Enterprises submit their draft plans to the appropriate ministries and to the local planning organs. Serious work on tying up the plans of enterprises in different branches, subordinated to different ministries and departments, into a single complex territorial plan takes place in the regional planning commissions, and later in the Gosplans of the union republics.

Thus, in the course of the elaboration of a plan, there is thorough circulation of information through different levels of planning from top to bottom and from bottom to top, as well as horizontally within levels to ensure harmonization of branch and regional interests, before the approved variant of the plan acquires the force of law.

What has been said above concerns the organizational aspect of the problem of cooperation between the branch and the regional organs of management and planning. No less important is the aspect of the problem that is reflected above all in the structure and system of indicators of complex regional plans – in the economic content of the functions fulfilled by regional planning organs. In particular, among the main tasks of territorial planning and distribution of productive forces the following should be singled out:

Narrowing the gap between regions in terms of economic development

Ensuring rational specialization of the economy of a republic in the all-union division of labor, as well as intrarepublican specialization of regions and economic areas

Ensuring integrated development of the economy of regions and economic areas from the point of view of the national economic optimum

Ensuring rational utilization in the regional cross section of fuel and energy, minerals and raw materials, water, and land, as well as labor, financial, and other resources

Ensuring rational territorial organization of production, which presupposes, in the first instance, formation of regional production systems of different classes, and creation of harmonious, balanced systems of settlement

Ensuring optimal distribution of objects of new construction from the point of view of minimization of social costs, with consideration of integrated value estimation of all construction conditions

The practice of recent years testifies that formulation of the enumerated issues in complex regional plans contributed considerably to the shaping of positive tendencies with regard to all the indicated directions.

Thus, complex plans for the development of the economies of regions make it possible to unite the efforts of various branches to solve qualitatively other problems of a synthetic character that none of the branch plans are able to solve objectively. This is why our state attaches great importance to the development of this form of planning and management of the economy. Rights of the local planning organs and of the union republics are constantly being widened in order to ensure close coordination of their efforts with the efforts of the economic branch organs. The regional organs of planning and management now have the following rights, which permit coordination of the development of the economy that is not subordinated to them:

- Construction of new enterprises or other objects beyond the bounds of existing enterprises and organizations cannot be started within the republic, region, or city without their agreement (the right of veto with regard to construction).
- According to the legally established procedure, plans for and estimates of the cost of new construction of production objects must include creation of a housing and community services complex. If construction is envisaged within city lines, all the funds assigned for the creation of the housing and community services complex are at the disposal of the local organs of government, usually with some participation by ministries and departments, so that the local organs can ensure the most rational distribution of new objects, taking into account existing conditions in the city (the right of project planning of new housing and community services construction and coordination of investments in new construction).
- Enterprises of all-union subordination must submit draft plans to the regional planning commissions of those regions in whose territory they are situated, and all-union ministries and departments must submit draft plans for the enterprises subordinated to them to the Gosplan of the appropriate republic.
- Local organs of planning and management submit, through the council of

ministers of the republic, proposals to the ministries and departments for setting up new production facilities or developing existing facilities that are expedient from the point of view of efficient utilization of the resources of the region. There are, for instance, lists of cities and settlements, approved by the governments of the republics, where new production facilities should preferably be set up (the right of initiative).

Thus, branch ministries and departments cannot in a number of cases act without the agreement of the regional organs of management; they must also take into account economically feasible proposals of the local organs.

IMPROVING THE ORGANIZATION INTERACTION OF MANAGERIAL AND PLANNING ORGANS

The further improvement of the organization and mechanism of interaction among the territorial managerial organs demands more precise definition:

What kind of works and operations must the process of interaction in various functions of management in a given territory comprise?

In what sequence must these works and operations be applied, and what type of managerial methods must be used?

What kinds of resources and deadlines are necessary?

How effective is the use of these resources?

How can action of the various managerial organs in the region be organized rationally?

The rational organization and mechanism of interaction among managerial organs within the territory presupposes constant improvement of the methods for fulfillment of the managerial function; more rational distribution of duties, rights, and responsibility among various managerial organs in the territory; and the determination of the optimal structure and staffing of these organs.

The basic initial materials for organization of a rational mechanism of interaction between the managerial and planning organs in the region are technological maps for the processes of composing documents – i.e., for gathering, processing, transmitting, and storing documented information, which is used by the interacting managerial organs; exemplary norms for spending work hours for joint managerial tasks and activities; sample decisions, instructions, schemes and charts reflecting interaction between regional managerial organs; consistent recommendations related to the combined methods of management leading to realization of rational interaction between managerial organs. Concentration of a large volume of managerial work in regional managerial organs considerably influences the development of the regional automated system of management (ASU).

Other problems related to the improvement of the mechanism of interaction between managerial organs in the region likewise demand solution. Among these is the problem of coordination of the industrial enterprises and amalgamations serving agriculture with agriculture itself within the limits of the region, as well as the improvement of economic and production–technological connections by means of rational division and cooperation of labor among the collective farms (kolkhozes) and state farms (sovkhozes), amalgamations, and production complexes located in the given region.

All of this makes it necessary that regional managerial organs exert appropriate influence on branch organs in order to ensure comprehensive development of the region, the rational use of natural resources, elevation of the effectiveness of social production, and improvement in the well-being of the population of the entire region.

The practice of management of the national economy has developed effective forms for interaction between branch and regional organizations. This is especially noticeable when strictly goal-oriented programs are implemented.

Problems of regional significance are examined from the viewpoint of the economic effectiveness of the branch. For this reason, the most effective method of taking the interests of a region into account is the correction of the branch projects by means of their correlation with the long-term complex plan for development of the entire region.

With the assistance of the regional complex plan, various branch managerial organs, together with the executive committee, party organizations, scientific research institutes, universities, and other organizations, can decide on the priority of introducing new enterprises. Through the coordinated activity of managerial organs in the region, the synchronization of the formation of the entire production system and the cultural and everyday life services for the population is ensured. This interaction is especially important for regions that have been newly developed in terms of industry and agriculture. Considerable experience in this regard has been accumulated in the Krasnoyarsk region, in the Irkutsk and Tomsk provinces, in Kazakhstan, in the Ukraine, and elsewhere.

In the improvement of methods and preparation of new methods for combining the branch with the regional aspects of planning of the development of the national economy, the following issues require futher investigation:

Interrelation of territorial cross sections of the plans of different branches

Interrelation of territorial cross sections of the plans of individual branches with the plans for the complex development of the economy of the regions

Harmonizing plans for the complex development of the economy of individual regions between regions

Harmonizing plans of the entire system of regions on a nationwide level

Let us point out some directions along which, it seems to us, a solution to these problems may be found.

In the future, it will be necessary to take the role of resources into account more explicitly in complex regional plans. Indicators of the availability and utilization of regional resources, compiled on the basis of appropriate balances, can become one of the main sections of the complex plan. It is the natural and labor resources that, on the one hand, determine specialization of the economy of the region and its participation in the all-union division of labor and, on the other hand, limit the possibilities for development. We must foresee, for instance, where shortages of manpower or water would arise, to what extent nonagricultural use of fertile lands should be restricted, to what extent forested areas must be protected. The resources section of the regional plan must also contain a list of measures for the preservation of nature and the protection of the environment from the harmful effects of production activities.

The resource section of the plan provides a basis for the organs of territorial planning and management to set limits and restrictions on the utilization of scarce resources. The branch ministries and departments would then have to take into account these limitations when elaborating plans for their enterprises. In fixing limitations on the utilization of resources, the local planning organs would have to apply a system of preferences for different production facilities. The least stringent limitations should be placed on production facilities whose development is necessary from the point of view of the all-union division of labor and on production facilities based on deposits of unique useful minerals or other resources in the given region.

The difficulty of implementation of such a proposed procedure of cooperation between the regional and branch organs is twofold. First, there is the insufficient national economic competence of the regional, city, and district planning organs who will be given the right to exert a substantial influence on the proportions of the development of the economy. Therefore, evidently, the limitations proposed by the local organs must be sanctioned by the Gosplan of the union republic.

The second difficulty lies in the necessity to do all this cumbersome work quickly so as not to retard the elaboration of the final version of the plans. This task must be solved through widespread automation of planning calculations and a systemic approach to planning. Work on the creation of a system of automated planning calculations in the union republics and regions is already under way.

The second important direction for harmonizing branch and regional plans is the strengthening of the role of the local organs of management in the organization of interbranch relations, intraregional transportation, production services, development of interbranch production facilities, and concentration of investments of various departments on a shared basis for the creation of objects utilized in common – that is, in the solution of interbranch questions of organization of social production. These functions are already being fulfilled by the local planning organs, as they submit appropriate proposals to the government of the republic or to union ministries. It seems to us that this function will develop further. There are proposals, for instance, that local government organs (the appropriate sections of the executive

committees) draw up a single construction program for the region and that they serve as a wholesale middleman between customer-departments and the building organizations (a kind of general customer).

The third direction discussed in our scientific literature is the strengthening in the long run of regional economic analysis and statistics. A number of researchers think that it would be useful to work out systematically in plans and statistical reports indicators of the volumes of the total product and national income created in the regions and to calculate summary indicators of the standard of living and consumption for regions, cities, and districts. Today, all these indicators are elaborated for the republics, and are elaborated for smaller areas only on a one-time research basis.

The practice of territorial planning has raised a good many more methodological, organizational, and legal problems. Scientists and specialists of the planning organs are working on their solution.

There is no doubt that in the near future the role of territorial planning and of the local organs of government will grow and that their active participation will contribute to the solution of the general state tasks of raising the efficiency of production and ensuring a further growth in the well-being of the working people.

13 Organization of Planning in a Production Amalgamation: The Volzhski Automobile Plant at Togliatti

P. M. Katsura

AMALGAMATION: AIMS AND TASKS

A production amalgamation is characterized as a single production and economic complex comprising separate plants, scientific research, design, technological project organizations, and other productions units. The production amalgamation is the basic link of industry. Its activity is built on Lenin's principle of democratic centralism, i.e., centralized leadership combined with broad participation of the workers in the management, with the maximal development of their creative activity and granting the necessary independence and initiative to the basic production units. The main aim of the amalgamation is continuous development and improvement of production of designated products for the fullest possible satisfaction of the requirements of the national economy and of the population.

When an amalgamation comprises independent enterprises and organizations, its relation to them is that of a superior agency for economic guidance. At the same time, the state does not answer for the obligations of the amalgamation, and the amalgamation does not answer for the obligations of the state. Procedures for realization of internal economic relations in an amalgamation, the consequences of violation of their obligations by production units within the amalgamation, and procedures for solving internal business disagreements within the amalgamation are determined by the amalgamation itself. The functions of planning and managing the entire activity of the enterprises, organizations and production units which make up an amalgamation are fulfilled, as a rule, by the staff of the principal plant in the amalgamation.

The basic principle of organization for an amalgamation that builds machines is specialization, either with regard to product or with regard to manufacturing process.

Large amalgamations – having at their disposal considerable funds and resources

for scientific–technical and research work – are vested with wider rights in the utilization of their resources. On this basis, they speed the introduction of new technology and improve the quality of products. Effective utilization of information and computing capabilities is also easier in large organizations. For these reasons, consolidation of enterprises and creation of production amalgamations are necessary preconditions for a wide introduction of automated systems of management.

The development of the systems of production amalgamations of different types in all branches goes ahead with a simultaneous review of the existing structures of management for the branch as a whole. It is directed toward a reduction of the number of links and levels of management, as well as toward more rational distribution of functions among the links in the system of branch management. Further development of the network of amalgamations will improve the structure of industry, sharply reduce the number of plants subject to control from the center, and free central economic and planning organs from the necessity of dealing with a mass of operating problems, enabling them to concentrate their attention on fundamental long-range problems for the development of each branch.

The Volzhski amalgamation for the manufacture of automobiles (AvtoVAZ) represents a comprehensive multibranch structure. It extends from organization of production output to the implementation of concrete socioeconomic tasks for the personnel of the amalgamation.

The Volzhski Automobile Plant amalgamation includes four autonomous technological production units: metallurgical, cold stamping, mechanical assembly, and body assembling plants; there are also branch plants for the manufacture of hardware and standard machine components, automobile bodies, and body fittings (all situated 200–700 km from the principal plant). The amalgamation also includes a construction trust, for construction and maintenance of factory buildings, as well as of structures for cultural and everyday services; public catering (providing hot food for all the personnel of the plant) and maintenance of all housing; and guaranteed service and technical repair of the automobiles produced by the plant, distributed all over the country.

ORGANS OF PLANNING IN THE AMALGAMATION

The amalgamation is headed by a general director acting on the basis of unified authority. Areas of competence of deputy general directors are fixed by the general director. A council has been set up, consisting of the general director, his deputies, directors of enterprises and production units, leading specialists of the plant, and representatives of social organizations.

The council of the amalgamation considers a number of subjects: it drafts long-range and current plans for the development of the amalgamation; reports on the production and business activity of the enterprise and its individual structural

units; addresses problems of raising the scientific and technical level of the work that is being carried out and improving the utilization of science and technology in production and problems of improving the efficiency of investments; considers the introduction of scientific organization of labor, production, and management; drafts prices for the most important types of products; selects and assigns personnel; and treats problems of formation and distribution of incentive funds. Decisions of the council are implemented, as a rule, by the orders of the general director.

In order to attract a wide range of industrial and office workers to participation in the solution of the production problems, permanently functioning production conferences are organized at the enterprises of the production amalgamation.

The functional structure of management of the amalgamation consists of two main groups: the apparatus of the enterprises and production units in which most of the employees are concentrated, exercising direct management of the work of the shops; and the apparatus of the general management, implementing solutions of the most important technical and economic tasks connected with the future development and coordination of activities of the amalgamation.

The management structures functioning at the enterprises are divided into two comparatively separate spheres depending on their relation to the production process: the line personnel (foreman, head of a sector, head of a shop, director of a production unit) and the functional apparatus (the production, technological, economic, and other services). The forms and methods of cooperation between these spheres are not always sufficiently efficient in practice. As a rule, the same group (department) within the higher management is responsible for both the operating and strategic decisions. As practical experience testifies, operating decisions usually dominate strategic ones simply because of their nature (their frequency, their urgency, and so on). Hence orientation is normally toward the achievement of a current objective. Measures with consequences more distant in time recede into the background.

The problems of interfunctional integration and internal line coordination have been solved most effectively at the Volzhski Automobile Plant. Organizational conditions have been created that allow the interests of the whole to take priority over parochial functional interests. The level on which final decisions are adopted is thereby brought closer to the sphere of operating activity. Responsibility and authority are transferred, if necessary, to lower levels of management. Higher management is thus freed from current work with regard to the management of production, and the system as a whole becomes more adaptable. It acquires structural flexibility, capacity for internal adaptation, and ability to handle new tasks.

Five main structures and, correspondingly, five agencies of management for making plans can be singled out: capital construction management, technical management, production management, economic management, and warranty and technical service management.

METHODS AND CONTENT OF PLANNING

The AvtoVAZ Production Amalgamation was formed in the early 1970s. Lack of any traditions of our own (and the inevitable conservatism that accompanies tradition) made it possible, even during the period of designing the Volzhski Automobile Plant, to formulate and introduce new methods into the organization of planning at the construction stage and production start-up, and after the plant had been put into operation. The principles of planning and economic incentives used were based on considerable positive experience of enterprises of Soviet industry and took into account relevant practice of other European countries.

Considering its scale of concentration of resources, the Volzhski Automobile Plant is the first such engineering complex with a complete technological cycle of automobile manufacture in the Soviet Union or elsewhere. This approach is attracting the attention of a number of project-design organizations, and the experience of creating and operating the Volzhski Automobile Plant deserves broad attention. Three stages of experience, each of which reflects advanced methods of planning and organization of work, should be singled out: the period of design and construction, the period of start-up; and the period of operating the complex as a working production amalgamation. Each of the enumerated stages represents a complex program of work in which dozens of major enterprises and organizations with considerable material and labor resources cooperated.

The effectiveness of the planned system of socialist economy was most fully revealed at all stages. Six months after the decision to create the Volzhski Automobile Plant, a technical plan of the plant was worked out and approved. By a decision of the government, major specialized construction organizations were put to work. Within a short time they set up the necessary construction industry resources and assembled the necessary personnel.

Thanks to the involvement of more than forty design organizations from all over the country, for the first time in Soviet practice a simultaneous method of design and construction was applied with equipment supplied by hundreds of firms from Western Europe and by enterprises of the countries of the Council of Mutual Economic Assistance. Construction elements of buildings and structures were designed with a high level of prefabrication, so most of the work on the construction site consisted of assembling these elements.

During the most intensive stage of work, the volume of construction and assembled investments amounted to over 1 million rubles per day. The total period, from the beginning of the construction to the production of automobiles, was 3.5 years, which is 25 percent less than the norms accepted in the construction industry.

In the course of the second stage (preparation and start-up of production), under conditions of extensive construction, successive adjustment of equipment in each section of the plant and testing for rated productivity was carried out. At the same time, the first cars were assembled, mainly with imported assemblies and components, with subsequent intensive replacement by units of domestic

manufacture. This shortened the time required for testing equipment and training teams of workers.

An important element in the program of work at the second stage was the training of the workers. During the start-up period the main complement of workers and employees was put together. Staffing of the plant followed plans of distribution developed by the appropriate central planning organs of the country.

The plan for training of workers included probationary work at foreign plants that supplied the equipment, training at existing Soviet automobile plants, training directly at workplaces in the new plant during the assembly and adjustment of the equipment, and, finally, training in special programs at the educational center of the plant. Even though only 10 percent of workers at the plant had previously worked in the automobile industry, mastery of the technology of production, of the modern complicated equipment, and of the rated productivity was effected in a steady manner and with good-quality performance.

Before the amalgamation entered the active start-up stage, a good deal of complicated work had to be done to elaborate plans for achievement of rated technico-economic indicators. The methodological basis for the elaboration of the purposes and tasks of production amalgamation are calculations and justifications of a technical–industrial and financial plan for the amalgamation as a whole and for each production unit. The technical–industrial and financial plan is worked out and approved by the amalgamation on the basis of the centrally set tasks of the national economic plan. It has nine main sections that ensure integrated interconnection of all productive and business activity of the amalgamation:

1. *The plan for improvement of technology and organization of production* is the most important section for justifying changes in the technical and economic norms that are the basis for elaboration of the technical–industrial and financial plan. This section ensures that each planned indicator is justified by technico-economic calculations and that the development of production, economy, and finances of the amalgamation is mutually harmonized.

The main content of this section consists of the tasks relating to increasing the level of mechanization and automation of production; introduction of advanced technological processes; implementation of research and experiments connected with the improvement of technology, machinery, and organization of production; elaboration of measures directed toward saving materials and working time; and measures aimed at improving working conditions.

2. *The plan for production and marketing of products* is the leading section of the technical–industrial and financial plan. The plan for production and marketing of products determines the content of the remaining sections of the plan as well, because all of them are aimed at ensuring the fulfillment (and indeed overfullment) of this section. Marketing of products in physical and monetary units serves as the main indicator of this section of the plan.

3. *The plan for improving the quality of output* fixes tasks in the field of quality

enhancement of output and the ways of achieving these gains. Its main indicators include control parameters (total and specific) for introduction of new types of products within the total output, modernization of the types of products produced currently, and discontinuation of production of obsolete types of products.

4. *The plan for utilization of productive capacity* has as its aim the determination of the maximum possible output of production and the possibilities for achieving this output in the planned period, as well as the discovery and elimination of production bottlenecks that could hamper fulfillment of the production program.

5. *The plan of capital construction* indicates changes in the makeup of the basic production funds of an enterprise. This section is particularly closely connected with the section relating to the planned utilization of productive capacities. The main indicators here are volume and trend of the work relating to the expansion and reconstruction of the enterprise, liquidation of bottlenecks of production, modernization of equipment, rationalization of technological processes and replacement of obsolete equipment, and introduction of new productive capacities into service.

6. *The labor plan* fixes the most important indicators of the activities of an enterprise: the wages fund and the growth of the productivity of labor. Its main indicators are output of production per worker, number of people employed, the fund of wages, and the average wage of the people employed.

7. *The plan for materials and technical supply of an enterprise* justifies the requirements of the enterprise as regards all kinds of materials and technical resources in order to ensure the output of production in accordance with the national economic plan. It also determines the size of inventories of materials.

8. *The plan for primary costs of production* shows the extent of expenditure for production and the primary costs of particular types of products. The main indicators of this section are the total sum of expenditures for the output of production, the planned primary costs of the most important items of production, and goals for reduction of the primary costs of production in costs per ruble of marketable output.

9. *The financial plan*, as the concluding section of the technical–industrial and financial plan, sums up the entire production and business activity of an enterprise. The main indicators of this section are the total sum of income of the enterprise and of its expenditure, the size of budgetary allocations and of contributions to the budget, the size of turnover in areas that are subject to norm-setting, coefficients of rates of turnover, and the size of the profit and return on assets. An extremely important section of the financial plan of an enterprise is calculation of the funds for development of the production, material incentives, social and cultural measures, and housing construction.

The technical–industrial and financial plan is elaborated both for 5-year plan period and for each plan year.

Plans of an amalgamation are, of course, an integral part of the plans of the respective branch of industry, which in their turn are part of the national economic plan.

So that the plant could reach its rated capacity and the rated productivity of labor and primary costs of our cars as quickly as possible, special organizational and economic plans were worked out for the period 1971–1975. The following indicators were established as fund-forming indicators: a coefficient of putting the designed capacity into operation, a coefficient for achieving the rated prime costs of cars, and, as an incentive indicator, a coefficient for achieving the rated productivity of labor. The methods and principles for formation of incentive funds are designed in such a way that there is no lowering of the annually approved technicoeconomic indicators with respect to the level adopted in the 5-year plan. When project indicators are fulfilled ahead of time, i.e., when the indicators adopted in the plan are higher than those approved in the 5-year plan, incentive funds increase substantially. If, on the other hand, indicators below the level envisaged by the 5-year plan are adopted, the size of the incentive funds falls sharply.

In the shops of our plant, which employ a thousand and more people, no functional apparatus is envisaged: It is centralized at the level of production units and fulfills all functions starting from the preparation of new types of products, fully ensuring material and technical resources required by the current production. It also has the necessary legal and economic independence. This special feature substantially increases the role of the functional apparatus with regard to results of the economic activity of the shops and of the plant as a whole. The system of internal plant cost accounting is constructed, basically, on principles of closed economic responsibility and material incentives for the activities of the production and auxiliary subdivisions of the plant.

There are several special features of the system of material incentives. Accounting requirements with regard to the primary economic units – the brigade – are reflected in the remuneration of labor of the workers. Remuneration of labor provides for the collective interest and responsibility of the brigade for fulfillment of its tasks: output, productivity, and quality. Such responsibility is stimulated by additional payments when performance exceeds planned norms, by bonuses for increased productivity of labor, and by supplementary payments for professional skills. Material incentives for the functional staff ensure general collective responsibility of subdivisions for fullfillment of the main indicators. At the same time, they are differentiated, i.e., they assume a definite material interest of each functional subdivision in the achievement of specific indicators of its own.

The effectiveness of the organization of planning in a production amalgamation is determined to a decisive extent by the normative and technical base that provides a foundation for the operating management of production, for technical and economic planning, and for accounting and control of the economic activities of the amalgamation as a whole and of its subdivisions. The normative base of the plant includes the following initial data: the list and summary specifications of parts and assemblies making up a car; technological specification; norms of consumption of the principal and auxiliary technological materials; labor standards with data on operational time standards for the manufacture of parts or the assembly

of sections and with indication of the production brigades assigned to the fulfillment of these tasks; and price lists for materials, prefabricated parts used to assemble a car and the finished goods.

The automated data processing system (based on computers and peripheral equipment) of the amalgamation constitutes an integrated system. It embraces all aspects of the activities of the plant: the design and technological preparation of production, planning and recording of the progress of basic production, control of assembly conveyors, supply of main and auxiliary materials, recording of the movement of the personnel and the calculation of wages, organization of the repair of equipment, planning and recording of production and distribution of spare parts, bookkeeping and accounting, and so on.

The main principles of construction of the automated data processing system are as follows:

1. Decentralized entry of all the operating information about changes in the state of production via peripheral equipment at the place of origin of the information (this simultaneously gives primary documents and punched tape)
2. Arrival of all the normative information at the computing center in the form of primary documents that have legal force, with their subsequent keypunching and validation
3. Recording of only deviations from the planned states of production in order to cut down on the flow of information to the computing center, with subsequent processing simultaneously of the plan and of the deviations to obtain the final result
4. Careful protection of the basic and operating files from unreliable information by checking *all* primary information arriving at the computing center
5. Centralized processing of primary data and consolidation of the basic and operating files of production data; centralized processing can provide the necessary statistical data in the form of hourly, daily, monthly, quarterly, and annual reports

The following aspects of planning and control of economic activity have been mechanized in the amalgamation:

The planning of production schedules. In order to automate this function, the computing center carries out (along with the monthly and annual cycle) work on compiling a production program, itemized by component, for the production and delivery of parts and assemblies. This program includes all parts requirements, requirements in man-hours, and requirements in machine-hours.

Control of production progress. In this subsystem, control on the basis of a daily cycle is envisaged: fulfillment of the program of finished manufactures and of work-in-process for serial shops, fulfillment of the program of deliveries for the mass-production shops; arrival, dispatch, and inventories of parts; and levels of faulty product. The entire initial information about the movement of parts arrives at the computing center in the form of a punched tape. On the basis of

the recording of the subsequent movement of parts, the computing center prepares daily balances for an analysis of the utilization of materials and control of parts that are in short supply.

Control of assembly conveyors. This is also singled out in a separate subsystem. It solves problems with regard to the acceptance of orders for fulfillment of various modifications of automobiles; draws up the daily plan for output of cars and control of its fulfillment; sets the stage for trouble-free supplying of the main assembly conveyor with basic parts; initiates work on a car and issue of the equipment card; records the volume of car production; and controls the progress of production of the main assemblies.

Two electronic computers are used for the implementation of this task. A number of terminal devices and teletype printers are connected to these computers by means of communication channels; these terminal devices are used to record the arrival of the main assemblies at storage points and the passage of cars through checkpoints. Among the checkpoints are the welding of the frame, painting of the body, leaving the assembly line, and the final control and dispatch of the cars. Teletype printers are used for printing equipment cards and relaying reports to all the storage lines for the principal assembly of the automobile being made in order to synchronize the work of the main conveyor with that of the feeding conveyors.

The material and technical supply subsystem. This system concerns all types of materials produced outside, including basic materials, subassemblies, auxiliary materials, materials for repair and maintenance purposes, and spare parts for the equipment and tooling. This subsystem embraces the following types of work: control over the delivery of materials in accordance with contracts; recording and analysis of faulty products delivered by suppliers; operational recording of the state of storage reserves; control over the distribution of the main materials and subassembly to the shops on the basis of appropriate monthly programs; and primary bookkeeping at storehouses. These tasks are facilitated by recording the information reflecting the arrival of materials at storage points and their distribution to the shops, and by the subsequent processing of these data together with the file available at the computing center (a price list of the materials, inventory information, and records on contracts with the suppliers).

Record-keeping for personnel and calculation of wages. This subsystem is concerned with the following tasks, among others: recording of movements of plant personnel; preparation of statistical data on plant personnel; recording and analysis of the utilization of the working time; calculation of indicators of production and of the efficiency of labor; calculation of advance payments and of wages; formation of the monthly report on wages. Basic files on personnel data and additional payments and withholding of wages are used in the implementation of this work. Notices about acceptance for employment and notices of changes in personal status are used as primary data on personnel mobility. Operational information regarding the recording of the working time, supplementary payments

and witholding of wages are reported to the computing center daily by means of peripheral communication equipment.

Control of auxiliary production of tools and equipment. As an independent subsystem, this subsystem presupposes all of the above systems, applied to building and assembling tools and equipment for the main plant.

Technical servicing of cars and provision of spare parts. This is the planning (annual, quarterly, and monthly) for the production of spare parts; shipping of these parts from the spare parts center to the consumers; preparation and control of accounts invoices for spare parts; operational and accounting records for automotive centers around the country on the sales of cars and spare parts and technical servicing of cars; files on claims for faulty parts and accumulation of statistical data regarding car defects. The construction of this subsystem is based on decentralization of the system of data collection and processing at the level of the amalgamation's local automobile centers.

Technical and economic planning and accounting. Automation of this planning function presupposes utilization of computers for compiling normative calculations for parts, assemblies, and finished products; for accumulation and analysis of costs of production and calculation of actual primary costs; for planning and control of the volumes of output; for formation of the technical–industrial financial plan; for drawing up a balance of turnover and a summary bookkeeping balance; for stock-taking on basic assets and calculation of deductions for depreciation; for calculation of production capacities; and for other tasks.

Fulfillment of the enumerated functions of planning and control over the activities of the amalgamation is determined by a system of interrelated procedures for the exchange of documents and by the system of responsibilities of the personnel in different subdivisions.

Operating fulfillment of these functions makes it possible to raise the effectiveness of the factory thanks to:

- More accurate planning of indicators
- Operational discovery and profound analysis of deviations arising in the course of production
- Improvement of reliability and operational flexibility by obtaining data for the management and guidance of the work of the subdivisions and for adoption of the necessary administrative decisions

14 The System for Stimulation and Fulfillment of Especially Intensive Plans

G. A. Egiazarian

An important aspect of the centralized planning system is elaboration and execution of intensive plans – plans that require efficiency in the utilization of all production resources to meet to the fullest degree the needs of the national economy.

These intensive plans are set on the basis of progressive scientifically supported normatives for the use of industrial capacities, raw materials, fuel, energy, and so on. These plans also build upon the achievements of pioneers and innovators in industry who achieve high labor productivity and the best technical and economic results. In addition, in estimating the intensity of plans, the projected indicators are compared with indicators in the corresponding branches of industry abroad.

An important precondition for the definition and execution of intensive plans is the establishment of an elastic system of material incentives. For the establishment of this system it is necessary to solve the following three problems:

Improvement of the availability of general economic prerequisites necessary for the development and execution of intensive plans

Justification of a system of indicators for rating the intensity of the plan tasks

Establishment of a correlation between indicators and the size of incentive funds received by the collectives of enterprises and amalgamations

Solving these problems ensures the coordination of the interests of the collectives of the enterprises and amalgamations with the national interest, which is expressed in the goal of socialist production – that is, satisfaction of the material and nonmaterial needs of society as well as of each individual.

DEVELOPMENT OF GENERAL ECONOMIC PREREQUISITES FOR DEFINITION OF INTENSIVE PLANS

The first prerequisite is an effectively functioning principle of democratic centralism that will ensure the effective coordination of a centralized government policy with the broad participation of industrial working bodies, combined with the creative initiative of the latter in working out plans. The second prerequisite is the establishment of a stable system of indicators and normatives that will remain in effect during a 5-year plan period, and the transformation of 5-year plans into the basic form of state management of enterprises and amalgamations. The third prerequisite is the reorganization of a system of management of industry on the basis of the introduction of a system of production and industrial amalgamations. These prerequisites ensure the effective organization of work on the development of intensive plans.

CRITERIA FOR MEASURING THE INTENSITY OF PLANS

For evaluation of an intensive plan, the level of the indicators included in the plan, as well as their growth rates, is considered. These two aspects of evaluation complement each other and offer a concise expression of a plan's static and dynamic characteristics. As a basis for comparison of the indicators according to their level and growth, the data of the accounting period, the draft of the plan for the period under consideration, and the data of a related group of enterprises can serve.

Of significant importance is a comparative analysis of the degree of the intensity of plans of enterprises. In this respect, the following criteria are used in Soviet industry: First, there are the aggregate criteria that characterize the results of the economic activity of enterprises, amalgamations, and industrial branches. The most important of these are the rate of increase in sales volume, labor productivity, profit, and return on assets employed. Further, a set of normatives characterizing the degree of utilization of industrial capacity and material, labor, and financial resources is used to rate the intensity of plans. For example, normatives for the use of industrial capacity may be used for enterprises in operation. Finally, normatives for asset intensity, labor productivity, and material intensity, developed in a centralized way, are also used.

The role of physical indicators of the plan in the evaluation of the activity of enterprises and the incentive level is currently increasing. In particular, for the evaluation of the activity of enterprises and amalgamations, there has been an increase in the importance of the fulfillment of delivery contract obligations with regard to the type and quality of goods offered.

These indicators and normatives, which determine the intensity of plan tasks, serve as the basis for incentives for intensive plans; these incentives are ensured by both an overall system of incentives for particular branches of industry,

amalgamations, and enterprises and a number of special methods and economic levers.

The system of incentives for fostering interest in intensive plans provides for the establishment of functional interdependence between the results of the operations of enterprises, amalgamations, and industrial branches and the size of the incentive funds at the disposal of the corresponding working collective. Through this interdependence, it is possible to give a relative advantage as regards material incentives to those collectives that work better and fulfill more intensive 5-year and annual plans.

In a broad sense, the interdependence between the results of labor and incentives is governed by the entire system of economic levers regulating the distribution of profits in industry. These levers are wholesale prices, payments for fixed assets, interest on credit, economic incentive funds, and the free profit remainder. In the narrow sense, this interdependence is governed by the system whereby incentive funds are formed and used.

The system for profit distribution derives from the primacy of the national economic interests. It is determined in a centralized way and assigns priority to the satisfaction of the social needs.

For all industry, the most of the profit returns to the state budget for centralized reallocation. The profits of enterprises and amalgamations are distributed basically as follows: First, some of it is incorporated into the budget in the form of payments for the fixed assets* and circulating funds as well as payments of interest on credit to the bank. The second portion of profits that remains for the enterprise is used to provide economic incentive funds: material incentive fund, the fund for social and cultural measures and housing construction, and the fund for the development of production. The remainder of this portion of profits is used to finance the plan expenses of the given enterprise. This includes financing of centralized investments and paying-off of credits on earlier investments, financing of the growth of the enterprise's own circulating funds, covering of losses due to operation of housing and communal services, and so on. The difference between the total profit and these payments and deductions is the free profit remainder, which is then entered into the budget.

The payment for the basic production funds and circulating funds consists of a portion of profit that is deducted by enterprises or amalgamations and transferred into the budget in proportion to the cost of funds. The deduction is made in accordance with the centrally established rates. The payment for funds has two functions. On the one hand, it secures the return of a portion of the profit to the central government, and, on the other, it stimulates the economic interest

* Fixed productive assets represent the sum total of means of labor in monetary terms circulating more than once in the production cycle and partially transferring their value to the commodities as they wear out. Circulating productive funds are materials, fuel, and raw materials that are fully used up in each production cycle and whose full value is transferred to the commodity during one cycle.

of amalgamations and individual enterprises in improving their use of production funds.

Incentive funds perform two functions: First, they give the personnel a sound material interest in the technological improvement, efficiency, and development of the industry. Second, they create internal productive sources necessary for development of the industry.

The material incentive fund is used as a source of regular bonuses for all categories of personnel, for direct encouragement to complete especially important production tasks, for rewarding personnel for the net annual results of their work, for prizes to winners of socialist competitions, and for supplying other material assistance.

The fund for social and cultural measures and housing construction is used to improve culture and everyday social amenities, as well as the medical service of the workers in an enterprise; to purchase passes to recreational centers; to equip restaurants, recreational centers, clubs, children's institutions, and other cultural and social needs; and to pay for the construction and heavy repairs of living quarters, clubs, recreational centers, kindergartens and nurseries, and other facilities for social well-being.

The production development fund is used to finance investments for the introduction of new technology, for modernization of fixed assets, for improvement of organization of production and work, and so on.

Economic incentive funds had the following indicators in 1975 (in millions of rubles)*:

Material incentive fund	5,663
Fund for social and cultural measures and housing construction	1,782
Production development fund	4,388

The distinguishing characteristics of this system of fund-building derive from the fact that while the material incentive fund and the fund for social and cultural measures serve the function of providing material incentives for the workers, the development fund performs a production function. Thus, the sources, indicators, and standards used in forming them are different. The source of the first two funds is profit, but the development fund is formed from three sources: depreciation allowances used for complete restoration of fixed assets (their share in the development fund is now about 60 percent), deductions from enterprise profits, and earnings from the sale of obsolete, excess property from fixed assets.

The indicators for formation of the incentive fund and the fund for social

* *National Economy of the USSR, 1975.* Moscow: Gosstatizdat, 1976, p. 739.

and cultural measures are return on assets, the growth in sales volume (or profit), labor productivity, and the portion of high-quality products,* while the established rates for deductions are expressed in percent of the material incentive fund. The development fund is formed in accordance with standards set at 30–50 percent of the depreciation allowances for full replacement and standards calculated directly in percentage of the profit.

Because this fund is accumulated in this way, its size depends on the enterprise's need for resources to develop production. Indeed, the larger the enterprise, the greater the amount of investments necessary for improving its fixed assets. But if, all other conditions being equal, one enterprise functions better and realizes greater profits, it can set aside more for the development fund.

In addition to economic incentive funds within the enterprises and production amalgamations, centralized funds for material incentives and development of production are formed in branches of industry. The ministries approve the standards for overall deductions for funds for the given managerial body (industrial amalgamation, etc.), which then sets the standards for the enterprises within the limits of the total funds formed in accordance with these standards.

The system of forming and using centralized funds in managerial bodies has several notable features. These funds are created by deductions from the planned profits of subordinate enterprises. The centralized incentive fund is used to provide an immediate incentive for enterprise personnel to carry out especially important tasks, as prizes to the winners of socialist competitions, to supplement the incentive funds of subordinate enterprises when that is necessary, and to form an incentive fund for the high managerial apparatus. Up to 50 percent of depreciation allowances can be used in accordance with the norms approved for amalgamations in general to form the centralized development fund.

Reserves are created in the ministries and departments for all three economic incentive funds. These reserves, together with the centralized funds, may not exceed 10 percent of each fund for the ministry or agency as a whole.

Ministry reserves for the incentive fund and the fund for social and cultural measures are used to supplement the incentive funds of enterprises that make wide use of new technology; enterprises engaged in expanding the manufacture of mass-demand goods with relatively low profitability; and enterprises whose performance indicators have fallen off temporarily because of the introduction of new technology. They are also used to ensure the stability of the standards set for payments to the enterprise funds and for other purposes. The system of centralized reserve funds creates conditions for the development of cost accounting in amalgamations and ministries.

The material incentive fund is the main incentive fund for industry. As we have noted, it ensures a direct interdependence between labor efficiency and the

* Besides these, the indices characterizing the quality of production influence the volume of incentive funds.

size of that portion of the profit used to provide incentives for the given enterprise's workers. Material incentive funds of ministries, amalgamations, and enterprises are integral parts of both the 5-year plans and the annual plans.

When the 5-year plan is being worked out, ministries and departments design incentive funds and the standards for setting aside money for these funds on the basis of the draft 5-year plan drawn up by the Gosplan of the Soviet Union. The size of the funds and the standards are then approved by the USSR Gosplan for the ministry as a whole. The ministries in their turn approve standards and the funds for each year of the 5-year plan for the enterprises and amalgamations. Here, the sum of the money in these funds must not exceed the sum set by the USSR Gosplan for the ministry. The system of setting up incentive funds in the 5-year plans of ministries may be illustrated by the example of the tenth 5-year plan (1976–1980).

The planned size of the industrial material incentive fund and its net growth for the years 1976–1980 is determined for the last year of the 5-year plan on the basis of data for the main rates and proportions of economic growth; changes in the structure of real incomes; and correlations among the growth rate of labor productivity, wages, profits, and other indicators. After this, the planned increment in the material incentive funds is determined for each year of the 5-year plan and is distributed over the 5 years in proportion to the planned increase in commodity production or profit for each year. Finally, the overall planned size of the incentive funds for each year of the 5-year period is defined.

The size of incentive funds stipulated in the 5-year and annual plans may be adjusted up or down, depending on increases or decreases in the growth of production volume, profit, productivity of labor, return on assets, and the share of production of high-quality goods in the total volume of production. Comparisons are made between what is put into the annual plans of an organization and indicators set in the 5-year plans for the given year.

This means that the more intensive the plan for a given year (as compared with the 5-year plan) in an amalgamation, for example, the larger will be its incentive fund. Conversely, if an amalgamation approves a less intensive plan (as compared with the goals of the 5-year plan), its incentive fund will be smaller.

Adjustment of the incentive fund is effected in accordance with specially set normatives for profit tax deductions. These normatives are set for each of the indicators given above for each percent of their increase in percent of material incentive fund of the initial period.

Table 14.1 shows that in the plan for 1978, the enterprise has increased the growth rate of productivity of labor by 1.5 percent and the volume of commodity production by 1.8 percent in comparison with the targets of the 5-year plan, and the share of high-quality commodities by 1 percent. As a result, the material incentive fund has grown from 911,000 rubles (in the 5-year plan for 1978) to 969,700 rubles (in the adjusted year plan), an increase of more than 6 percent.

TABLE 14.1 Mechanism of Material Incentive Fund Adjustment

Indicator	Unit of Measure	Set in the 5-Year Plan for 1978	Project Plan 1978	Difference
Productivity of labor per worker	percent of 1975	146.0	147.5	+ 1.5
The share of high-quality commodity in the total commodity production	percent	20.0	21.0	+ 1.0
The increase of commodity production	percent of 1975	165.1	166.9	+ 1.8
Normatives assigned	percent			
For each unit increase (decrease) in growth rates of productivity of labor compared with goals set in 5-year plan			2	
For each unit increase (decrease) in share of high-quality commodity in total commodity production compared with goals set in 5-year plan			2	
For each unit increase (decrease) in growth rates of volume of commodity production compared with goals set in 5-year plan			1	
Material incentive fund in the plan for 1975			863,400 rubles	
Material incentive fund in 5-year plan for 1978			911,000 rubles	
Adjusted material incentive fund in approved plan for 1978 to comprise:				
Increment of material incentive fund due to growth rates of productivity of labor in annual plan compared with goals of 5-year plan $\frac{(1.5 \times 2 \times 863{,}400)}{100}$			25,900 rubles	
Increment in material incentive fund due to increase in share of high-quality commodity in total commodity production in annual plan compared with goals of the 5-year plan $\frac{(1 \times 2 \times 863{,}400)}{100}$			17,300 rubles	
Increment in material incentive fund due to increase in growth rates of the volume of commodity production in annual plan compared with the goals of 5-year plan $\frac{(1.8 \times 1 \times 863{,}400)}{100}$			15,500 rubles	
Total increment in the material incentive fund			58,700 rubles	
Total material incentive fund for 1978 (911,000 + 58,700)			969,700 rubles	

Correct determination and use of normatives for deductions play a significant part in the development of intensive plans.

The experience gained in the industry of the USSR confirms that when ministries,

amalgamations, and enterprises are informed of these normatives before the working out of the plan is started, the results achieved in the development are better and more stable. The normatives set in the preplan period function without adjustment during the plan period. Thus for example, the normatives set during the development of the ninth 5-year plan were in use during the whole period of the 5-year plan.

An important incentive factor is a correct ratio between standards used for fulfillment and overfulfillment of plans. To create a greater vested interest in adopting intensive plans in industry, rather than setting targets low and working for overfulfillment, the standards to be set aside for the incentive fund for each percentage of overfulfillment decreases (by at least 30 percent) as compared with the standards used for deductions in comparison to plan indicators.

Since 1973 the enterprises and amalgamations of Soviet industry have developed a progressive form of socialist competition aimed at the adoption and fulfillment of intensive plans. The workers of tens of thousands of enterprises and amalgamations are working out and effectively fulfilling response plans on the basis of being able to accumulate and use internal reserves. A response plan set by an organization is an alternative plan with higher targets than the plan received from above for the same year. These plans organically incorporate the personal and collective socialist commitments of workers and service personnel. They also provide for a special system of incentives for a response plan, namely, an increase in the size of incentive funds as a function of the growth in the performance indicators of enterprises and amalgamations as a result of the targets that the response plan sets.

Thus, the system of economic incentives in operation in industry in the USSR encourages personnel to develop, adopt, and fulfill intensive plans.

Part Two

American Experience

15 The Challenges of Economic and Social Planning: An American Perspective

THE ESSENTIAL PLACE OF PLANNING IN THE AMERICAN SYSTEM

Any discussion of planning in the United States moves almost immediately to the level of local units, such as corporations or agencies of government in one of the 50 states or thousands of counties and municipalities. The American system calls for decentralized and largely independent operation by such units, particularly by corporations. Corporations have taken the initiative to plan in order to increase the profitability of current operations, in order to improve coordination of complex aggregations of programs and resources so that they can grow in size, and in order to survive and prosper in the face of changing environmental conditions. Corporations have been encouraged by society to plan to improve their efficiency in the use of scarce resources and to assure that their future development anticipates and meets new societal needs.

If planning is done mainly at the level of the corporation, then the American system assumes that the workings of market forces and of democratic political forces at the state and federal level will provide checks and balances to keep the plans within reasonable bounds. These same forces will assure that the plans and the actions that result from them will – taken together across the nation – produce overall economic and social results that are beneficial to society as a whole.

The federal government engages in large-scale economic forecasting. To an increasing degree, it also does economic planning that affects corporate decisions. As the American chapters explain in more detail, the government takes decisions that affect basic supplies of capital and labor to corporations; it intervenes in important national problem areas: development of science and technology, extensions of international trade, planning for development and conservation of energy resources, planning for the shape and structure of national transportation and communications networks. However, this federal activity and intervention all takes

place, as it were, "under protest" – as a reluctant step by a nation that has deep skepticism about the wisdom of centralized national planning and that is committed to keeping as much planning power as possible at local levels.

Because federal involvement in planning is fragmentary and limited in scope and because corporations are, to a large degree, all free to establish their own approaches and procedures, there is wide diversity around the country in the degree to which formal planning is done – and in the ways it is done. All companies of any size and complexity must have some kind of planning system to ensure short- and intermediate-range coordination and efficiency in operations. Longer-run planning is not done regularly by a number of corporations, but the numbers that do not do it are shrinking rapidly. The most important developments in recent years, discussed in this book and exemplified by case studies, have involved the move from long-range planning, with assumptions of a relatively stable environment, to strategic planning, with assumptions of a changing and discontinuous environment for the enterprise. The most sophisticated corporate planning systems combine (a) highly complex forecasting models and tools, (b) long-range strategic analysis processes that ask what the firm can and ought to do to prosper and grow, (c) subsystems for organizational and operational planning that translate strategic choices into specific structures, programs, and actions that will achieve results, and (d) management review systems that not only assure control of plan implementation but warn when changing internal or external conditions require that plans be re-examined. These systems in companies like IBM or General Electric are very sophisticated and very complex.

The historical flow in American experience, then, concentrates on evolution within the boundaries of the corporation. Planning developed first as a means of controlling operations better. It then became a tool for rational long-term development of the enterprise and, through stategic planning, for anticipating and meeting new product and market opportunities. Now, with the greater interdependence of individual corporations and society, planners in the corporation must give more attention to societal factors. The federal government is expanding its own planning efforts, both to assist and to cross-check key areas of corporate planning. The dimensions of future federal involvement are unclear; but it is certain that each new step will be evaluated not only against what it promises to contribute to an improved national economic perspective but also against what it costs in terms of autonomy for local corporate or governmental units.

COMMON CONCERNS IN THE PLANNING PROCESS

Despite differences in the level of the economy at which planning is done and other differences in philosophy and approaches to planning, the seminars revealed a number of areas of common concern to American and Soviet planners. One is the task of forecasting the economic environment within which a company or a national

economy must operate. This has never been easy in either country, given their size and diversity. It has always been complicated for the United States because we tolerate a good deal of cyclical fluctuation in economic activity as one of the prices for a largely decentralized, market-driven economic system.

However, for both countries, new problems of forecasting have been introduced by the progressive internationalization of economic activity since World War II. Because many kinds of international trade now involve countries with quite different political and economic systems, forecasting techniques must be applicable not only at home, but for foreign systems as well.

A second common problem, well discussed in Professor Gvishiani's chapter, deals with planning both to accomplish and to accommodate technological change. The rate of scientific and technological progress has been increasing. It is important not only to forecast what is likely to develop, but also to plan which kinds of development investment would have the greatest long-range economic and social benefits. Part of the American interest in strategic planning came from the need to be more responsive to changes in the marketplace, but a great deal came – as the concept developed in companies like Lockheed, IBM, and General Electric – from opportunities to use technology more creatively to change the shape and mission of the corporation.

The idea of technological forecasting has a great deal of appeal in both countries, but it is not a process that is very well developed in either. We need to know better where science and technology are heading, better how we might try to shape their development, and better how to anticipate and control some of the side-costs that are associated with direct benefits of technological progress. There are opportunities for exchange between the two countries not only of techniques, but also of data and analysis, particularly on problems of global concern such as energy conservation and environmental protection.

Once the forecasts are done, as we move into the planning process proper, both sides reflect concern about the levels in the system at which particular planning steps are done. Who initiates, and who responds? Who has the main influence in framing goals, or in translating goals into strategies and action plans? When planning drafts have been formulated, who provides detailed critiques or "response plans"? In the case of conflicting views or jurisdictions, who makes the final decisions? How does the assignment of responsibility for making plans correspond to the assignment of responsibilities for executing them?

For us, we see the problem primarily in terms of levels within a corporation. For the Soviets, while the questions of levels within the enterprise is also of interest, they talk more about levels in the national economy: from the national Gosplan agency down through the branch system to ministry, production amalgamation, and enterprise and down through the territorial system to republics, territories, regions, and municipalities. For both of us, discussion of levels is complex, because planning is an interactive process, with steps moving up and back across levels several times before a final plan is completed and executed.

Within American corporations, emphasis has been put on local participation and responsibility. Such participation brings local knowledge and expertise into the framing of goals and the elaborations of the plan. It helps educate local personnel to see their jobs in the broader context of the total enterprise; and through their involvement, local people become committed to goals they have helped set. Nevertheless, the purpose of planning is to assure balance and trade-offs among local efforts and optimal decisions for an organization, or a country, as a whole. Invitations for local help must be real, in order to get assistance and commitment; but they must not be so open that they conflict with the making of appropriate higher-level decisions. American corporations keep experimenting to find ways to strike a better balance in laying out the locus and levels for planning actions and decisions, and the Soviet chapters in this volume indicate that they are continually experimenting on these issues as well.

To the extent that initiative in goal setting is delegated to local groups, a particular problem is designing incentives so that these groups will come up with ambitious, and not easy, targets on the one hand; and, on the other, that they are not pushed to be so ambitious that they commit the institution to something that is impossible to achieve. Targets must also be defined so that it is possible to measure whether they have been met; there must also be enough sensitivity in choosing measures of performance that success in meeting one measure, like output or gross sales, does not automatically carry with it failure to meet another, like product quality.

Another common problem, despite the different role of prices within the two economic systems, is the setting of prices for individual products. Research and development investments must be recovered. Costs related to environmental protection, safety and maintenance, and other social objectives may need to be considered. Some of the considerations arise from decisions and choices within the enterprise; others, in both countries, are a function of national governmental policies.

Looking ahead, both countries are going to be working harder to absorb the full implications of data processing concepts and information system technology into the planning process. The development powers of computers make many new tools available for modeling and for analysis. They have allowed data banks to be national in scope and have made larger-scale economic and social simulation feasible for the first time in human history. With the growth of real-time computer networks, the time between generation of data and its effective use for planning and control decisions is greatly reduced.

Yet none of this progress will come easily. Both countries have learned that the development of basic concepts, of computer hardware, and of specific programs has proceeded much faster than their effective integration into planning networks. There are many problems of macro-organization at the corporate and national level as well as of human engineering of links between individual planners and the computer resource that must be solved before the full potential can be reached. We still

can do a better job on both sides, according to the seminar discussions, in directing research on information systems technology to do more to enhance planning – in contrast with assisting ongoing management of current operations.

We believe as well, finally, that both societies must be concerned with the responsiveness of planning and planners to the population as a whole. The Soviet chapters stress at several points the importance of keeping economic plans consistent with broader social goals and of balancing the material against cultural and other nonmaterial aspects of life. In the American chapters, we have described the impact on corporations and government of things like the consumer movement – and have speculated that for ourselves, increasingly, planners will be operating in what might be characterized as "a kibitzer's society."

AREAS FOR FUTURE INTERCHANGE

It was clear from the seminars that there are few areas in which direct "borrowing" of practices is possible or desirable from one system to the other. At one level, as trade between the two countries, and more broadly, between other market-oriented and planned economies, expands, there is value in more of the kind of interchange that the seminars and this book represent: interchange to educate, interchange to increase mutual understanding and ability to work together. At another level, there are possibilities for more specific exchange and for joint development work in areas of technique: models for forecasting and simulation, data base and network design, integration of complex computer-assisted planning systems. At a third level, even though results must be adapted to reflect different social conditions, we would hope that the day may come when there can be joint studies of some of the organizational and human dimensions of planning – of some of the questions of assignment of responsibility across levels, of questions of how to set targets and incentives to achieve maximum performance effort, and of broader human consequences of decisions on science and technology.

Each of these issues is to some extent is a proprietary concern of two strong nations in healthy competition. But each, in another dimension, is a concern in which all of mankind has a stake in finding the best possible solutions.

16 An Overview of Planning in the American Economy

William R. Dill

Planning provides central direction and coordination for the organization and development of a socialist economy on a national scale. It does not play a central role in the structure and functioning of a capitalist economy, yet it is an activity of increasing scope and importance at a variety of levels. This chapter provides a general overview of the role of planning for American industry and government and serves as an introduction to the more specific discussions of the techniques and problems of planning in the business corporation.

To understand planning in the United States requires first an appreciation of some conceptual propositions concerning the objectives of the planning activity and, then, an understanding of the parts played by four major categories of organization in the society:

- The individual economic enterprise, or firm, ranging from very large, diversified, multinational corporations to firms the size of a restaurant or clothing store
- The federal government and its affiliated branches, departments, and agencies
- State and local government units, which to a large degree have more in common with individual firms than with the federal government
- Independent, advisory planning agencies, in business to give advice and support to both enterprises and governments

SOME BASIC PROPOSITIONS ABOUT PLANNING

As an observer of the American scene can tell by following debates among leading politicans and economists, there is no strong consensus at the moment about the role of planning in the structure of our society. On the one extreme, there are those such as Milton Friedman who would endorse planning only if done by firms

or lower-level societal units. On the other, there are those such as Galbraith and Harrington who argue that we have moved a long way – and should move still further – toward a centrally planned economy. The debate sometimes takes the form of "to plan or not to plan," but it really is more an argument over where to plan and what powers to give various planners over different segments of the economy and society. Currently, the debate centers upon a movement in Congress to create a stronger unit at the federal government level to map out long-range economic goals for the country, plans that, unlike their Soviet counterparts, would be general and advisory rather than specific and directive.

Proponents believe that more active planning at the federal level will lead to more sensible planning decisions by individual enterprises and to more enlightened public policy in guiding or regulating industrial and commercial initiatives. Opponents argue that the record of central planning units in other countries has not proved to be any more farsighted or beneficial to society than the decentralized planning efforts of individual enterprises, and they fear that what starts as advisory and indicative planning will soon become directive and coercive planning.

What is clear is that we start from a philosophical base that says that planning in the first instance is a local and private matter, something an individual entrepreneur, a firm, or a local governmental unit engages in so that it can serve its clientele better and so that it can be better positioned for survival and growth in a changing and competitive world. For the industrial enterprise, plans provide the basis for producing efficiently, for developing new technologies and products as markets change, and for ensuring that prices, market demand, and costs will be such as to produce a return on capital investment – or profits. For the local government unit, small or large, planning provides a rationale for development of land use, an orderly extension of community services, and a discipline for keeping expenditures in line with taxes and other revenues. One expects the market process – the "votes" of many consumer purchasing decisions – to keep the plans of the enterprise focused on real social needs. One expects the democratic political process – the votes of many citizens in a community – to do the same for plans of the political unit.

The basic, underlying design of the U.S. political structure in the eighteenth century, from which our present institutions have evolved, accepted planning as a local (microeconomic) activity, regulated by the marketplace and the ballot box. But planning was rejected as a major activity of central government, as yielding an unacceptable concentration of power. That government was supposed to govern best "which governs least."

The U.S. system encourages the evaluation of plans by *results* of the operations of an enterprise or a governmental unit. Thus, it is only recently that the American public has paid much attention to the *content* of plans that various organizations make. For business enterprises, and even for governmental units, the amount and methods of planning have been largely left for internal self-determination. The plans may serve only as a guide for internal action and usually, even for many

governmental programs, are not publicized. They need to follow no standard industrywide or national formats; and they do not, like plans in the USSR, acquire "the force of law." Some organizations expect plans to be followed closely, and monitor performance against the plan as closely as do ministries in the USSR. Others feel that the main benefit from planning is the self-education of those involved in the process, and that the finished planning document should not be taken too seriously.

All this indicates a tremendous diversity among organizations in confidence about the utility of planning, in the extent to which formal planning is actually undertaken, in the sophistication of approaches used, and in the degree to which planning actually affects operations. There are no national framework, no industry frameworks, and no regional frameworks to guide practice within the individual enterprise or government unit. Some minimal uniformity on particular types of planning is encouraged or enforced by legislation, but most develops out of a less formal process of imitation and diffusion of apparently successful practices.

Despite this rather haphazard environment for the development of planning as an important managerial activity, the rising emphasis on planning has been fully as great in the United States as in most other parts of the world. Some of this has come about, as we shall see below, because individual enterprises have found it greatly to their advantage – in fact, essential – to devote resources to looking ahead and plotting a course to contend with future market developments. Interest in planning has also developed, on a cross-enterprise and cross-governmental level, because decisions at the micro-level about complex and interconnected projects have had to be faced on a coordinated basis, rather than independently within individual organizations as in earlier periods.

Large-scale, cross-unit planning is now well established in a wide variety of areas. One of the earliest, if still partial, approaches to planning was the incentives offered by the national government in the nineteenth century to attract settlers, attract capital to build railroads and develop industry, and establish colleges and universities in the West. Other major examples – almost half a century old – are regional development programs like the Tennessee Valley and Columbia Valley Authorities. Industry–government collaboration has been prominent in the space program, from the voyages to the moon to the deployment of communications satellites. Organizations like the Port Authority of New York and New Jersey have worked under state charters with many of the freedoms of private organizations to develop transportation and commercial facilities vital to the stability of a large metropolitan region. New structures are now being developed to help control consumption of energy and speed the development of new energy sources.

Many of these efforts have the same kinds of time horizons as projects in the Soviet Union: 5–15 years, and sometimes more. Some, like the current energy program, are still young and relatively ill-defined; but others, like the Tennessee Valley Authority or the communications satellite program, have become stable parts of the American scene. All, though, retain something of a hybrid character

in which the state is reluctantly allowed to be a partner and to assert a strong voice in many areas – but their planning operations must leave a great deal of flexibility and initiative to the local economic and political units affected by the larger unit's decisions. In looking below at planning in the federal government, while there are a great many agencies involved in a great many kinds of large-scale societal planning, there are neither the mechanisms for nor the orientation toward the kind of integrated macroplanning for the total society that Gosplan is chartered to do.

PLANNING WITHIN THE ENTERPRISE

Planning has been an important management activity within the enterprise ever since business began to grow to a size where investment decisions had long-range consequences and where efficient production and service to customers required closely coordinated and scheduled work by a variety of different work groups. In the early stages, however, "planning" was primarily short to medium range, focused on operational decisions, with the orderly layout of schedules and resources for the days, weeks, or months ahead. This typically involved planning in four functional areas of the firm:

- Financial planning, involving the preparation of budgets, including the careful planning of supplies of working capital to tide firms over between the time they incurred expenses and the time they recovered expenses, through the collection of accounts for sale of goods and services
- Physical planning for the growth of production, ranging from the construction of facilities and the purchase of equipment to the layout of production operations
- Production planning, chiefly the scheduling of manufacturing or service operations to control – and, if possible, to minimize – costs of materials, labor, and other inputs
- Sales planning, often the scheduling of advertising, sales calls, and other efforts to promote the sale of product

As organizations grew and became more complex, these operational planning tasks also grew in complexity. Today they invite the use of large staffs and sophisticated computer, mathematical, and statistical techniques. Budgetary planning has become a major control force within the organization for allocation of human and material resources among diversified goals and activities. Production and marketing planning frequently uses complex models of optimization. Manpower development planning, not emphasized until recently, has become an important new dimension of operations planning.

While organizations were growing, however, environments in our market economy were changing. There were swift changes in consumer demand, new technologies to

exploit, the shift of emphasis from domestic to international markets and competitors and the pressures – because of longer-term implications of capital investment commitments – to look farther into the future when planning was done. Companies like DuPont and General Motors decided that, in order to develop their positions, they needed to do more than a good job of operational planning. They needed to plan for changes in basic goals and strategies. Out of their experiments and the conceptual work of many people has evolved the concept of *strategic planning* or strategic management.

The strategic focus moved planning up to the highest levels of corporate management, as a central corporate activity. It incorporates a concern for defining the environment in which the organization must live and move; mechanisms for facing basic decisions about direction of movement in terms of products to offer and markets to serve; an emphasis on cohesiveness and distinctiveness in the things a firm attempts to do; and an orientation toward flexibility in the face of change.

Most large enterprises and many smaller ones now have several cycles of planning activity going on at once. Top management is concerned about long-range strategies and the integration of these with 1–2-year plans for operations. Middle and lower levels of management provide many of the inputs for strategic plans, but are charged mainly with developing and executing good operating plans.

What are the essential characteristics of the plans and planning processes that emerge in these enterprises? As we have stressed earlier, there is tremendous diversity. There are still many firms – mostly small, but some large – that do relatively little long-range planning of any kind. For firms, plans are internal. They need not be reported to government and are usually not known even to stockholders of the firm. They are often held privately and even secretively because they contain proprietary information that could harm the competitive position of the enterprise should competitors have it. By definition, then, the integration of plans among firms in the same industry is not possible for competitive reasons and would be disallowed under U.S. antitrust laws should it be attempted.

While much of the planning in larger organizations is done by specialized planning staffs, even in the largest corporations there is an emphasis on involving operating executives. Their knowledge and experience is important for making good plans, and their participation in the preparation helps assure their cooperation in the implementation. Operating managers in most large American companies know that they operate in the shadow of a plan for their activities, and that their advancement, bonuses, and salary are affected by their performance relative to the plan.

PLANNING IN THE FEDERAL GOVERNMENT

The goal of the federal government in planning as interpreted by the Congress and the courts was originally viewed as the facilitation of the free flow of commerce and the effective workings of market mechanisms, and ensuring that these mechanisms

worked so as to serve – rather than thwart – societal needs. The philosophy of government was, and still largely remains, mainly to oversee the operations of a *decentralized* system in which planning is done by individual units within the system. It is not generally to plan on a central basis.

However, two centuries of legislation and of interpretation of the Constitution have opened the door for the federal government to play a stronger role in the economic system and in planning for certain activities. The actual utilization of the federal government's powers on economic matters varies with the particular views of the President and the Congress, and the interaction of the two branches. The Ford Administration's political and philosophical orientation was to minimize federal regulation, involvement, and planning. But much more emphasis on economic planning is possible within our governmental system.

The influence and involvement of the federal government in economic planning takes three broad forms in the United States. The first, and most direct, is the planning for federal governmental operations and programs. This is of major importance, since federal government operations account for almost 9 percent of total national expenditures. Each governmental department and agency prepares a short-term budget (looking approximately 18 months ahead), and most prepare guidelines for longer periods. In several large programs requiring long lead times (the space agency, energy program, Defense Department, and the like), longer-term plans are developed, but largely on an individual program basis. It has been in the development and management of these complex programs that several of the most sophisticated techniques in planning have been tested and refined, such as Planning, Programming, and Budgeting (PPB) and benefit–cost analysis.

The short-term plans (budgets) of the various federal agencies are coordinated and harmonized by the Office of Management and Budget (OMB) in the Executive Office of the President. It is here that the attempt is made to develop coherent and consistent governmental spending plans, reflecting the program priorities of the Administration and the competing requirements of the various agencies. While the individual agencies develop their own programs and plans, they do so within the shadow of the OMB. Although there remains great diversity *within* the federal government's planning processes, and integration is not complete, in that conflicting and inconsistent programs remain, standardization of technique, timing of planning preparations, and the like have progressed to a considerable degree.

Within the American system of government, the planning and budgeting of governmental activities need not assure their execution. The Congress must appropriate the funds for the *specific programs* – e.g., defense, agriculture, education. It has been more the rule than the exception that the congressional appropriations are significantly different from the planned amounts reflected in the federal budget or in the longer-term plans of specific agencies. It was also true, before 1974, that the appropriations laws were enacted separately, with little if any attempt to coordinate legislation for the various programs, as was done in the Executive Branch by the OMB. In an attempt to rectify this lack of budget coordination

on the legislative side, a new joint committee of the Senate and the House of Representatives was created, with a Congressional Budget Office staff to parallel the OMB. This new committee, while representing an effort to provide more consistency among congressional expenditure and revenue-raising functions, does not assure consistency between the plans of the Administration, partially harmonized by OMB, and the Congress, partially harmonized by the Budgetary Committee. Thus, at the federal level, there remains a considerable lack of coherence in the planned economic activities of the government itself.

A second broad area of federal government planning involves the planning of macroeconomic policy. Although there is considerable debate about the effectiveness of policy initiatives, it is generally accepted that governmental initiative in this area is desirable for forecasting, planning, and influencing the level of overall economic activity. The policy tools involved are those relating to monetary control – banking system revenues, the money supply, and the level of interest rates – and those relating to fiscal policy – the relationship between total federal government spending and tax revenue, and the structure of the tax system.

Here again, several federal government agencies are involved. In the Executive Branch, the principal actors are the Treasury Department, the President's Council of Economic Advisors, and less formal interagency economic policy committees serving in advisory or coordinative capacities. Separate but closely related to the administration is the Federal Reserve Board, whose members are appointed for terms well beyond the elected term of the President. In the Congress, the Joint Economic Committee, the Joint Budget Committee and the House Ways and Means Committee exercise great power and influence over fiscal policy as actually carried out.

Coordination in policy planning and execution among these various groups is essential if consistent policies are to be implemented. On occasion in the past, inconsistent policies have clearly been in evidence: a monetary policy sought one objective, while fiscal policy moved in the other direction. This remains a possibility, but the degree of coordination in policy planning has been high in the recent past.

There have been several proposals to increase "central planning" in the United States. These proposals relate almost exclusively to *macro-policy planning* and articulation of national objectives by the federal government, and not to the physical or financial planning for individual enterprises or industries.

The third major area of federal influence on planning is its indirect effect on the plans of individual private firms and lower levels of government. Three types of such federal influence deserve mention.

- Increasing efforts by the departments and agencies of the Executive Branch are devoted to trying to develop data, suggest planning premises, and stimulate collaborative efforts in predicting and shaping future environments. Many agencies, relating to particular industries or sectors of the economy, maintain a continuing

interchange with corporate executives and staffs on planning questions. These may range from examining the impact of new technologies to identifying possibilities for foreign trade. These efforts become more intense when, as in the effort to reorganize the railroads of the American Northeast or in the effort to solve the "energy crisis," problems lie clearly beyond the capacity of single firms to solve, and government policy will have a direct impact on the activities (and plans) of those firms.

- A variety of general and specific regulations shape and limit the flexibility within which individual enterprises plan. Prominent and long-standing are the antitrust laws, which are designed to discourage firms from planning to achieve monopolies in the markets they serve. More recent are a variety of laws that set limits on practices in foreign trade, on minimum wages and working conditions for employees, on product quality and safety, on environmental pollution, and so on. Most often, though, these efforts take the form, not of planning instruction or limits, but of the specification of incentives and penalties to influence corporate plans away from certain socially undesirable results.
- In some industries, the federal (or state) government plays a very direct and detailed role in planning and interrelating the activities of individual enterprises. The Interstate Commerce Commission was set up to do this for the railroad and trucking industry; the Civil Aeronautics Board for airlines; the Atomic Energy Commission for the development of atomic power plants; the Federal Communications Commission for radio and television; state public utility commissions for electricity and telephones; the Department of Agriculture for farmers. Even in these industries, however, relatively little planning is done by the agencies and their staffs. They influence planning mainly by approving and disapproving what individual organizations propose with respect to prices, market structures, investments, and other issues.

Even for those in industry and government who believe that more planning should be done on a central basis, there is great concern about how to create institutions that can do this well. In key areas where interfirm and interindustry collaboration is needed to address long-range national problems, a central contribution to the planning effort would be to society's benefit. However, when the federal government tries to address urgent issues such as the control of inflation or the development of new national energy policies, the multiplicity of interest groups and the competition among them within the federal government is significant. To the enterprise willing to accept central guidance, it often appears that the federal government speaks with a multitude of conflicting, uncoordinated voices.

The distinctive character of planning initiatives by the federal government is that they are taken against a background of general reluctance to plan centrally and within the structure of a governmental system that was designed to regulate and limit, more than to engage in societal planning.

Expansion of central planning efforts is likely to be the result of a broad political

consensus that such planning is unavoidable in specific areas, rather than of a clear conviction that central planning is either feasible or good.

PLANNING BY STATE AND LOCAL GOVERNMENTS

Smaller governmental units – fifty states and the thousands of counties and municipalities – look in many ways more like individual business enterprises than like the federal government in their approaches to planning. They share many of the same powers of the federal government, along with a number of additional local powers, to shape, limit, and control the operations of private economic enterprises. But in their role as economic and social entities, they face major planning problems of their own, which frequently overlap with planning problems of the firms within their jurisdiction.

Local governmental structure in the United States suffers from the same problem that exists in many countries. The primary governmental units and their boundaries often do not correspond with modern economic planning needs. For example, many of the nation's major metropolitan areas, which should be considered as integrated economic and planning units for most purposes, are in fact under the control of a multitude of city and town governments and, in several cases, even fall under more than one state government. Thus, for example, the New York City metropolitan area lies in three states; Philadelphia, two; Baltimore–Washington, two plus the District of Columbia; Chicago–Gary–Milwaukee, three; St. Louis, two.

At the level of smaller subdivisions, a single neighborhood may in many states find itself involved in a dozen or more separate local governmental units: the general village, town, and county governments; a school district with boundaries different from those of the town or village; a separate water and sewer district; a federal post office district; a police and fire protection district; and so on.

Planning under such circumstances can be and usually is disorganized and fragmentary. The planning actually accomplished has mainly been concerned with the fairly elementary question of land-use planning, fiscal planning, and planning for the supply of major municipal services (e.g., schools).

There has occurred a trend toward the consolidation of government structures. And as the budgets of some local entities (such as New York City) have grown to billions of dollars a year, and as the need to renew communities as well as to build them has been recognized, planning has become a more serious local function. Many special agencies and authorities have been established to handle planning and operating problems that cross traditional community or regional boundaries.

Communities within regions have banded together, sometimes with the assistance of financing from private foundations or the federal government, to develop long-range community plans that may encompass everything from street and housing maintenance to grand schemes for attracting new industry and new population.

These plans are often developed with the cooperation and involvement of business firms in the community or region. In developing plans for attracting industry and population, a community (or state) may be in competition with other communities (or states). Thus, even at the lower governmental levels, there is no central coordination of the planning process to ensure consistency of objectives. Like the modern American corporation, the modern American city or state government has made increasing investments in staff, resources, and methods for designing the directions of future economic and social development.

ADVISORY PLANNING AGENCIES

A wide network of organizations has sprung up to aid business enterprises and governmental units – local, state, and federal – in the planning process. Some have developed to provide a stable mechanism for discussion, study, and debate among the private firms in a particular industry, across industry or governmental groups, or across various levels of government. Others have developed to supplement staff and resources in organizations that are already equipped for planning, or to provide staff and resource help in organizations that are not well equipped.

Some of these organizations have been established as independent agencies with public funding. Some exist through support from private sources, such as foundations or even individual gifts for endowment. Others sell their services for particular studies or projects to various private and governmental clients and are private, profit-seeking firms.

These specialized agencies provide many kinds of services. Some specialize in information: statistics, trend analysis, forecasts, market or voter surveys, for example. This information does not in itself constitute a plan – or even the elements of a plan. But such data are essential if organizations with limited data and analytical capabilities are to plan credibly. Such services also provide better-equipped firms with a means of evaluating their own information networks.

Other groups, such as the Brookings Institution, the National Planning Association, or the Committee for Economic Development, undertake independent review of some of the basic planning problems faced by government and industry. Their position papers and public forums seek to stimulate both public and private agencies to consider questions, opportunities, and techniques in planning that might otherwise be overlooked. They often help shape public pressures for improvements in the planning process.

Of the most practical significance, however, are the groups that provide contract research and consulting services to business enterprises and governmental units engaged in the job of planning. They add to the capabilities of an organization already experienced in planning, but they also provide the inexperienced organizations with the initial capabilities to develop and execute plans for themselves. Furthermore, as roving advisors who absorb ideas, data, and perspectives from their

various assignments, these research and consulting groups are a powerful force in American society for the diffusion of information and the standardization of techniques that improves both the substance and the process of planning.

Furthermore, to the extent that their own existence and growth as organizations depends on a growing interest in planning as a management activity, they become powerful missionaries for the advantages of planning within organizations and the society as a whole.

CASE STUDIES OF CORPORATE PLANNING

To illustrate planning as it is done, the chapters that follow include three case studies of real companies. Two of these – the IBM Corporation and the General Electric Company – are among America's largest and most complex corporations and among the largest of multinational enterprises. Both IBM and General Electric are highly technological businesses, requiring large capital investments and long lead times in product research and development to serve fast-changing markets. Both have experienced very rapid growth since World War II. As a result, each company has become a strong advocate of systematic management and a pioneer in seeking ways to strengthen its capabilities to plan and to achieve plans successfully through well-controlled operations.

The third company, Amstar, works largely with agricultural products to produce sugars and other sweeteners for the industrial and consumer markets. Like many American corporations in recent years, it has also diversified into other kinds of business very different from the lines it originally pursued. It is capital-intensive, somewhat simpler in overall structure than IBM or General Electric, and particularly vulnerable to wide fluctuations in supply and price of the raw materials on which it depends.

A fourth company, the American Motors Corporation, was discussed at the conference. It differs from IBM, General Electric, and Amstar in being one of the smaller, rather than the largest, firms in its industry. Its planning processes were much less formal, and were often much more concentrated on questions of sheer survival against larger and more stable competitors.

American Motors competes in the automobile and truck industry against General Motors, Ford, Chrysler, and a host of European and Japanese manufacturers. Between 1955 and 1975, it endured two periods of losses heavy enough to raise questions about its ability to stay in business and two periods of strong competitive performance and profit. Its most successful years have followed innovations in automotive design and market practice that set American Motors apart from the rest of the industry, but when its innovations succeeded, success was eroded by other firms following its lead.

In contrast to the three firms whose planning systems are described in more detail, American Motors does not have a planning staff. Its top-line executives

and their immediate subordinates are responsible for looking at future market and competitive prospects and for developing strategies for the firm. They act as a committee of equals, with different expertise and viewpoints, exchanging opinions and criticizing one another's suggestions on a vigorous and open basis. Planning starts with a review of the company's market share and market potential *vis-à-vis* competitors worldwide. The key decisions relate to consumer desires and product plans. General economic data and market research specific to automobile-buying plans and preferences are sought and analyzed. Then, market-based plans and strategies are checked against resource constraints: the firm's technical, manufacturing, service, and financial capabilities to carry them through. As a smaller, highly cyclical firm, American Motors has often been more limited than General Motors and Ford in the technical talent and the financing that it can put behind promising new developments.

Yet by any standards, American Motors is still a large, highly complex, and relatively successful industrial enterprise. As prologue to the General Electric, IBM, and Amstar cases, these comments on American Motors underscore the great diversity in planning approaches that exist in American corporations and the degree to which formalism of the planning process follows local decisions about need, rather than central prescriptions of uniform standards.

In all the cases, including American Motors, several things should be noted:

1. The emphasis and care that is given to defining within each corporation smaller, relatively independent and self-contained business units that can do both strategic and operational planning on a decentralized basis. American corporations have tried to move responsibilities for planning and management, in general, to the lowest possible levels that can act reasonably independently of one another.
2. A parallel emphasis on systems for strong corporate-level frameworks and guidelines to planning within the smaller units and for review and balancing of plans to fit corporate goals, strategies, and resources. The interest in decentralization does not override the strong conviction that the corporation must know where it is going and must balance the plans and operations of subunits in an effort to optimize overall use of corporate resources.
3. The relative neglect of discussion of frameworks and techniques in favor of stress on how a corporation organizes to plan and to link plans with operations. The process of planning makes contributions to the education of managers and to the commitment to support an overall corporate effort that exceed the importance of any planning document that is finally produced.
4. The joint interest in strategic and operational planning. Although the emphasis varies with the company, all four companies view planning as including strategic as well as operating decisions.
5. The treatment of government, for the most part, as a source of information rather than a source of plans. Amstar, for example, acknowledges its dependence in planning on future actions by government regulatory agencies, and both IBM

and General Electric have agencies of government among their major customers. Nevertheless, the American federal government receives only limited mention in these cases, chiefly as one of several sources of economic forecast data.

SUMMARY

This brief overview is not intended to describe in detail how planning is done in any particular sector of American society. Indeed, this may be impossible, given the diversity of techniques, emphasis, and complexity among the units even within a sector. It is to be hoped, however, that we have developed what may appear, from the Soviet point of view, to be a contradictory perspective. On the one hand, American society is organized and run according to economic and political principles that are intended to minimize the need for integrated societal planning – principles that reflect basic suspicions about the feasibility and wisdom of central planning. Planning is an activity to be encouraged within individual enterprises, local governmental units, or federal government agencies, when they find it productive. But it is not a required activity, as in the USSR.

On the other hand, American society faces the problems of complex societies the world over. The demands are high for integration of vast and diversified economic activities; for blending economic, technological, and social elements in a humane way; and for finding ways to make decisions today that will be not only efficient and good from a current perspective but wise from tomorrow's as well. These demands are creating pressures for better, longer-range, and more integrated planning not only at the level of local enterprises and governments, but from a national and international perspective, too. While the society has an inherent resistance to the expansion of certain kinds of planning, it is at the same time experimenting actively with new forms of planning in a pragmatic, pluralistic environment where there appears to be potential for making a decentralized system work better.

The long-range effort, though, still keeps the primary initiatives decentralized. The goal of current national policy is to stimulate, guide, and sometimes restrain those initiatives better – not to replace them with a centrally managed process.

17 The State of Practice in Planning Systems

H. Igor Ansoff

The aim of this chapter is to survey, in a historical perspective, the technology of explicit arrangements for guiding and controlling the work of complex goal-seeking organizations. In the practice of business, such arrangements are called *formal management systems*.

In the United States the prime inventor and developer of formal management systems has been the business firm. Almost invariably, the development has been triggered by a perceived deficiency: some management problem that resisted solution by previously available systems. The evolution of a new system was typically a trial-and-error process occurring in response to a growth in the scope and complexity of problems confronting the firm. Thus, it is useful to start a survey of systems with a brief survey of these problems.

EVOLUTION OF MANAGERIAL PROBLEM SPACE

The activity of the firm can be subdivided into two classes:

The *logistic* or productive activity devoted to the acquisition, conversion, and distribution of resources. In the United States this class is typically subdivided into functions of R & D, manufacturing, distribution, selling, purchasing, advertising, and promotion.

The *management* activity, which designs the logistic activity; sets objectives and goals, makes plans, and guides the execution of plans.

The logistic process is very complex, involving use and conversion of many inputs: raw materials, partially fabricated products, facilities, equipment, energy, financial resources, human beings, and information. At first glance, the management

process appears simpler because until a few years ago, it was essentially a "manual" process involving little labor-saving technology and virtually no capital labor substitution. The primary inputs to the process are still human beings, the "managers," and information, but the complexity is rapidly increasing because of complex new management technology and the entry of the computer into management.

Until the early 1950s analyses of management activity typically followed the *functional* structure of the logistic process (e.g., R & D management, production management). Overseeing the functional managers was *general management*, which was seen primarily as a process of "adding things up," coordination and integration of the functional activities. From the 1950s on, these traditional classifications became increasingly inadequate for understanding and analyzing the drastically changing agenda of mangerial problems. As a result, new classification schemes have emerged.

In the following classification are three hierarchically related managerial activities that guide the logistic work.

1. At the highest level, *societal management* determines the legitimacy and viability of the firm in society. It concerns itself with the firm's noncommercial environment: legislative, judicial, and regulatory governmental bodies, as well as social groups that have a "stake" in the firm: labor unions, consumers, shareholders, ecologists, and so on.

The end products of societal management are the freedoms, constraints, and "rules of the game" under which the firm operates within society. For the past hundred years in the United States and Western Europe, societal management has remained a minor activity, but it is now emerging as a puzzling problem, and will probably be the most important one facing management during the next 10 to 15 years.

2. At the second level, *entrepreneurial management* concerns itself with creating the profit *potential* for the firm: identifying areas of opportunity, creating and developing products for these areas, introducing the products to the markets. When the potential of an area is exhausted, or the products become obsolete, entrepreneurial management concerns itself with divestment.

3. At the third level, *competitive management* concerns itself with the conversion of the profit potential into real profits. This is the most familiar and prevalent management activity. It concerns itself with the functions of purchasing, manufacturing, distribution, selling, advertising, and promotion. As mentioned above, it is these operating activities that had been used for many years as a basis not only for classification of managerial work but also as an organizing principle in designing the structure of the firm.

Over the past hundred years, the three primary activities have shifted in their relative importance. In the United States, roughly from 1890 till 1950, competitive management remained central as the firm grew in scope and complexity. Since the

1950s, entrepreneurial management has begun to make inroads into managerial concerns; and in the 1970s, societal forces and pressures began to pose questions that required fundmental re-evaluation of the firm's role in society.

4. The fourth type of managerial activity, *administrative management*, concerns itself with providing the capabilities, skills, capacities, structures, and systems required by each of the three other types.

Each type of managerial activity places different demands on the capabilities of the firm. For example, successful societal management requires politically skilled managers and a good communication network with social and political bodies; entrepreneurial management requires creative R & D capabilities and an organization capable of converting inventions into commercial reality; successful competition depends on a fine balance between internal cost controls and external responsiveness to customer needs and wants. As priorities shifted from competitive to entrepreneurial to societal management, new demands were placed on administrative managements to provide the requisite capabilities.

The historical evolution of systems can be seen as the response to these changing managerial priorities. But a perspective on systems is likely to be distorted unless we keep in mind that changing priorities did not mean that the previously important activity "faded away." Rather, they meant expansion of the scope of managerial work. Today, good competitive management is no less critical to the survival of the firm than it was 50 years ago, but, increasingly, it has to share the limelight with entrepreneurial and societal management.

STATIC MANAGEMENT SYSTEMS

The constantly changing nature of managerial work generated a comparably changing need for formal arrangements for coping with and controlling new complexities. But a study of American business history shows that, added to the environmental pressures, there has always been a persistent internally generated drive to do things better and more efficiently. The result was a constant flow of new ways and approaches for doing managerial work.

The earliest systematic arrangements of the managerial work trace back to the second half of the nineteenth century, when the shape of the modern firm was just emerging. One of the first systems to emerge was the *standing policies and procedures* typically embodied in a manual under this name, which is still to be found in firms today. The manual collects rules for decision making (policies) and steps to be followed (procedures) for a wide variety of repetitive activities of the firm, ranging from hours of work, to leaves of absence for pregnant women, to union negotiations.

Another early development was a formal grouping of the firm's logistic and managerial activities that became known as the *organizational structure*. The first

formal structure to receive almost universal application grouped "like logistic activities" in ways that permitted maximum economies of scale and specialization. In this form, the managerial structure was made to follow the same logic, except for addition of the general management functions on top. During the following 60 years, this structure, which emerged around 1910 under the name of *functional structure*, was followed by a rich proliferation of replacement alternatives such as *divisional structure*, *multinational structure*, *matrix structure*, and *innovative structure*.

Until very recently, all these replacement alternatives shared with the functional form two important features that characterize them as static systems:

- They specified roles: responsibility, authority, tasks assigned to groupings, but did not specify the dynamic flows and interactions among them.
- A structure once put in place was supposed to be "permanent," not to be changed in the foreseeable future. The change typically came after it became evident that the structure had outlived its usefulness.

Static systems, exemplified by organizational structure, were a major step in systematizing the administrative concerns of management. They provide an overall conception of relationships throughout the firm that is easily communicated and that, like the trunk of a tree, can be elaborated with various branches.

Our attention here will be focused on the history of dynamic systems. They are *dynamic systems* in two senses of the word:

- They concern themselves with flows of information, influence, and decision making within the structure.
- They are explicitly concerned with the time dimension of the flows.

Before focusing on these action systems, we need to recognize that their relationship to organizational structure has been a close one. Historically, the dynamic systems have developed within the framework of structure. Structure provided the static network of relationships, the "plumbing" of the firm, and the dynamic systems defined the flows of information and decision making within the network.

It was not until the 1960s that dynamic systems (the first one being the Planning, Progamming, Budgeting System) found themselves so much at cross purposes with formal structure that another formal technique, called the "crosswalk," was invented to assure coordination of system and structure. The trend in the future will, without doubt, be toward a gradual disappearance of the distinction between static and dynamic systems and toward emergence of integrated systems and concepts.

EVOLUTION OF DYNAMIC SYSTEMS

All the early systems emerged in an environment that was, at worst, only mildly competitively unstable. As competitive instability grew, the duality of cost-focused systems and performance-focused systems increasingly created situations not only of the "right hand not knowing what the left hand was doing," but also situations in which the two "hands" began to act at cross purposes. For example, on occasion, plant capacities were expanded for products with declining demand!

A synthesis of cost and performance was offered by long-range planning, which emerged in the mid-fifties. It was the first to look at the firm in its totality. Long-range planning was hailed as the first management system to enable the firm to prepare itself for its long-term future. Since 1950, it has been widely adopted, first in America and, somewhat later, throughout Western Europe.

In the mid-fifties, an increasing number of firms encountered environmental problems that could not be handled by long-range planning. The reasons were not clear at the time, but a new system – Strategic Planning – emerged for coping with the new problems. It is now clear that the future projected by long-range planning was strategically stable and extrapolative; hence, the system was not capable of handling strategic discontinuities. Systems preceding and including long-range planning dealt with competitive management; strategic planning turned attention to entrepreneurial management.

But again, it did not replace long-range planning because it lacked a mechanism for translating strategies into actions: the stipulated output of the strategic planning process was a set of strategies which were to be "implemented" in a vaguely specified manner.

The Planning, Programming, Budgeting System (PPBS) integrated both strategic and competitive management. But it was more than a simple addition of strategic and long-range planning. It introduced a perspective on the environment that had been missing. The earlier systems perceived the environment through the perspective of their organizational structure: each important organizational unit made its own strategic plan. But in firms that were functionally organized, this produced an overly aggregated view of the environment, and in large divisionalized firms the perspective of the future was obscured by the multiplicity of product lines and markets and their interdivisional overlaps.

To avoid this loss of perspective, PPBS organized its environment into "mission slices" each of which represented a distinctive "product-market" area with distinctive needs, growth characteristics and risks. The term "mission slice," with its military overtones, was used because the PPBS was first applied in the U.S. Department of Defense. In its later translation into business practice, the term "mission" was initially carried over, but recently, the somewhat more precise concept of "strategic business area" has been introduced.

The strategic business area concept gives the firm a much clearer view of its environment and its future, but it frequently runs contrary to the logic of the firm's organizational structure. In the original PPBS application the contradiction was

solved by the "crosswalk" technique: the strategic plan was made by mission slices, and then cross-mapped into programs and budgets for the respective units involved in implementation.

PPBS is the most recent system that can be considered to be fully elaborated and developed. We next need to turn attention to currently developing and future systems.

TRENDS IN MANAGEMENT SYSTEMS

Long-range planning added programming and budgeting and PPBS combined long-range planning and strategic planning, treating entrepreneurial and competitive management within a single system. Strategic management, which is just emerging in business practice, is a further step toward comprehensiveness. It has three distinctive features:

- It recognizes that synthesis of competitive and entrepreneurial activities is not simple, that they make conflicting claims on managerial attention and resources, and that each requires a very different type of administrative system. To cope with this, the strategic management system introduces a new concept of *integrative management*, which assures "peaceful coexistence" of the two conflicting streams of activities.
- Strategic management recognizes that the administrative framework is an indispensable part of the total planning effort, that "structure" should not necessarily follow strategy but in many instances should precede it. To cope with the strategy–structure relationship, strategic management introduces the concept of capability planning and includes it in an integrated systems approach.
- Most important, strategic management is not solely a *planning* system, but a managerial *action* system as well. Thus, for example, in many instances creation of an appropriate *action capability* becomes a more central concern of strategic management than preparation of strategic plans. In this respect, strategic management is attuned to situations in which strategic surprises and shortage of environmental information limit the possibilities of formal action planning.

The first important step in the emergence of strategic management has been the emergence of strategic portfolio management. This technique addresses itself to the problem of balance of the firm's strategic investments among a number of strategic business areas, each of which has different future growth prospects and different catastrophic risk and opportunity prospects. As mentioned above, strategic management is on the threshold; thus, what we describe above is more a forecast than a reality.

Systematic approaches are now beginning to be applied to societal management. From the perspective of the firm, three major problems are involved:

- The first, which has been recognized and is in the early stages of being addressed, is the impact of noneconomic, nontechnological environmental forces on the economic decisions of the firm: environmental antipollution pressures, political pressures on multinationals, questions of product safety and occupational health, and so on.
- The second problem, which is now a vivid reality in countries like the United Kingdom and the Federal Republic of Germany, is the redefinition of the raison d'etre of the firm in the new postindustrial society: changes in the concept of allowable behavior, in the nominal ownership, in the power structure that guides the firm. This problem, which is receiving a great deal of attention from governments and special-interest groups, has so far elicited no constructive response from business management.
- The third problem, which has received the lion's share of attention and has tended to obscure the other two, is what has been called "social audit," which in sophistication would be roughly comparable to the financial control systems of 1910.

Undoubtedly, circumstances will force managements in the near future to give increasing attention to the first and third problems. An early system development will probably be enlargement of strategic planning to include the impact of social–political forces.

Another natural way of addressing societal problems is the currently developing *strategic issue analysis*. A major reason for emergence of strategic issue analysis has been the growing realization that integrated company-wide planning systems such as strategic planning, long-range planning, and PPBS, while comprehensive, are also cumbersome and unwieldy. The planning cycle typically lasts from 3 to 6 months, involves all parts of the firm, and incurs large direct and indirect costs. In an environment in which a 6-month period can bring about a fundamental change in the firm's perspective, this process may produce obsolete and irrelevant plans. In engineering language, the time constant of the plan is longer than the half-life of a change. Beyond the sluggishness problem lies the equally difficult cost problem: if the entire firm is to be exercised on each new major strategic issue, it will soon find itself in a perpetual planning turmoil, with little time left to attend to implementation.

Thus, emergence of systems such as strategic issue analysis and corporate portfolio management is a sign of a fundamental change in the philosophy of management systems. The progress from the early days of financial control to PPBS was seen by many as progress toward a fully integrated and comprehensive management system. But as the trend toward comprehensiveness continues, the requirement for integration and for frequent exercise of the entire system is slackening. Instead, the trend appears to be toward comprehensive, fully interconnected, but loosely coupled systems in which:

1. "Comprehensive" means a design that encompasses not only current concerns, but all important concerns of management that lend themselves to a systematic approach; not only the planning aspects of the process but planning *and* implementation *and* control.

2. "Fully interconnected" means that all subsystems within the total system that affect operations of one another are properly connected through informational and influence linkages.

3. "Loosely coupled" means, first, that each system is designed primarily to meet the needs of the particular managerial problem and secondarily to meet the needs of total integration–coordination. (This is precisely the reverse of the currently practiced design philosophy.) Further, "loosely coupled" means that the "time clocks" on which the subsystems operate are allowed to be different, so long as they are coordinated. In particular, this means freedom for *ad hoc* exercise of the system in parts of the organization in which special issues arise.

ENTREPRENEURIAL PLANNING SYSTEMS

In long-range planning, the future is made explicit through environmental forecasts. On the basis of the forecasts, goals for the near and long term (typically for sales, profits, return on investment) are set. These are translated into action programs, whose budgets typically exceed resources; feasibility is next checked, and the reconciled plans are examined and approved by higher management.

The validity of the resulting plan is no better than the validity of its information input. In long-range planning, the key input is the forecast of the future trends in demand, prices, competitive behavior, economic climate, and the like. Invariably, these forecasts are extrapolative – *smooth* projections of historical trends into the future.

It was inevitable that, when the environment became turbulent, a new type of planning system had to emerge, capable of coping with discontinuities. The result is a decision-making logic common to strategic planning, PPBS, strategic portfolio management, new venture planning, strategic issue analysis, and divestment planning. We have labeled it *entrepreneurial planning*.

Entrepreneurial planning makes two fundamental departures from extrapolative planning. First, it treats the environment in a much broader perspective. The forecasts of the future seek to discern significant new elements likely to emerge, as well as past discontinuities. The field of search for the threats and opportunities is much broader than in extrapolative planning, ranging beyond the traditional boundaries of the firm's environment to encompass technological, political, sociological, and economic trends that are relevent to the firm's future.

The second departure is in the manner in which the information is processed. If the information makes it evident that extrapolation is either dangerous or undesirable, a search for new alternative courses of action is instituted, their consequences are analyzed, and the best course of action is selected.

Enlarged environmental awareness necessitates enlarged *internal* awareness. If the firm is to consider alternatives to its past activities, it needs to know its capabilities and capacities for undertaking new departures.

Similarly, the problem of the firm's objectives comes to attention. Whereas extrapolation is used to establish goals, that is, new levels of traditional performance, the entrepreneurial openness of outlook poses a more fundamental question: what *kinds* of performance (objectives) and should the firm pursue, and with what priorities?

A BUILDING-BLOCK DESIGN APPROACH

One "building block" approach to management systems selection and design consists of stepwise enrichment of the content of the firm's written plan by adding additional chapters. Another building-block approach is shown in Figure 17.1. As shown in the upper right-hand part of the figure, there are six principal building blocks, or sub-systems, which together form a management system: A data base, a budget, a program, a plan (the decision-making element), a control (performance milestones used for monitoring and controlling implementation), and an implementation (norms and standards) subsystem. Table 17.1 describes the content of each building block: It can be seen that the content and the procedure of the "budget," "implementation," "program," and "control" blocks are not subject sensitive, but the "plan" and "data" blocks vary substantially depending on the problem being tackled.

Building-block approaches are a new development that make possible a systems design approach for selecting and tailoring the system to the needs of the firm. Until recently the procedure was to impose a "universal" system on all firms that were customers of one particular consulting firm. Thus all customers of McKinsey got "The McKinsey System," those of Urwick, "The Urwick System," and so on.

INDIVIDUAL ROLES AND RESPONSIBILITIES IN DESIGN AND USE OF SYSTEMS

Over the years, a number of "cliches" have emerged from the practice of planning. All cliches are insights, valid for special situations, which have become overgeneralized. But behind the planning cliches lies a real problem: how to match the problem-solving logic of systems to the realities of people and structure.

One of the cliches is: "Planners don't plan." It is a vestige of the long-range planning era, when extrapolation was the base for viewing the future. In those days the principal functions of the planner were to design and to install the system, to monitor its operations, and to coordinate and integrate plans prepared by working managers. Thus the planner did not plan (the working manager did): his job was to make the process work.

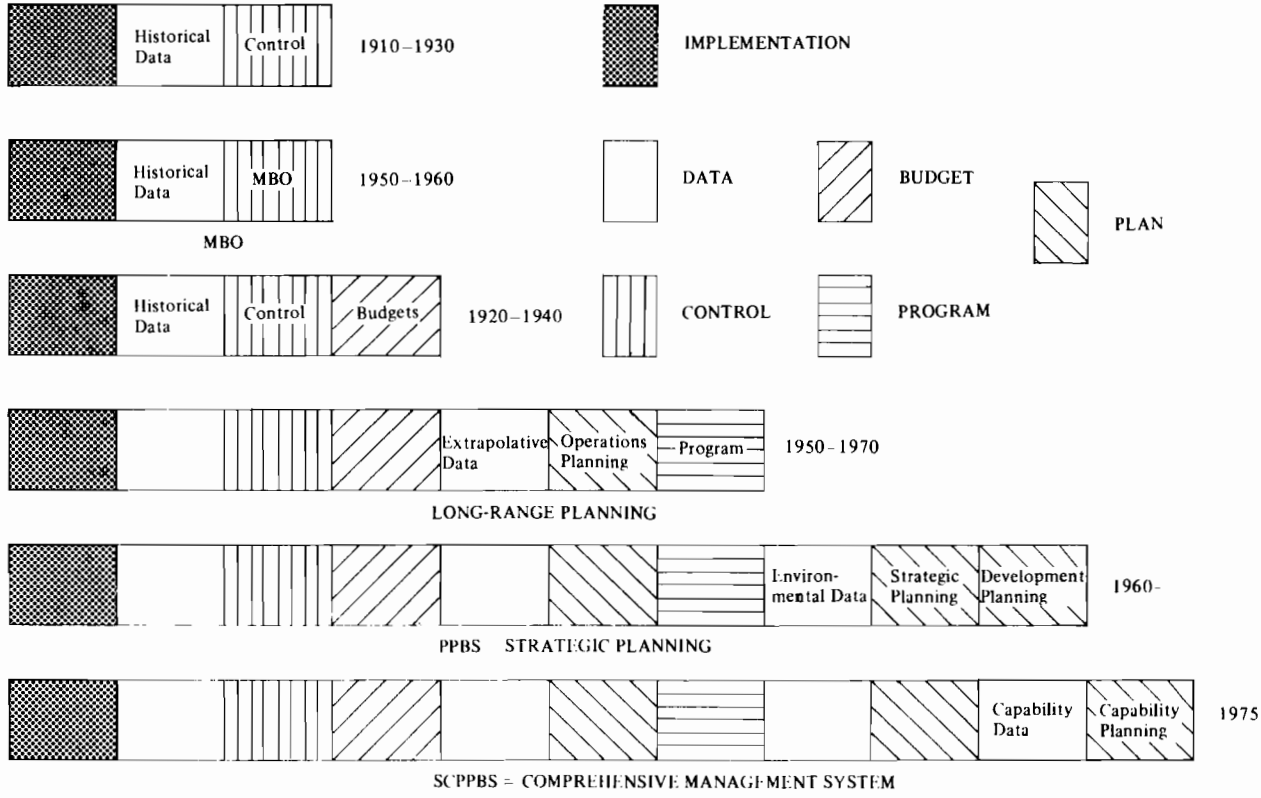


FIGURE 17.1 The building-block approach to corporate planning. Dates are approximate periods of growing acceptance.

TABLE 17.1 Subsystem Building Blocks (see Figure 17.1)

Implementation ("work-management")
- Establish work hours
- Communicate norms
- Monitor progress
- Correct performance of work

Control
- Establish output norms
- Measure performance
- Compare norms and performance
- Diagnose
- Correct

Budgeting
- Determine future pattern of activities
- Determine their costs
- Allocate resources among activities
- Schedule expenditures
- Establish milestones

Programming
- Determine performance objectives
- Analyze activities
- Schedule activities
- Establish performance milestones

Operations planning
- Forecast environmental conditions
- Forecast future demand
- Establish performance objectives
- Develop growth directions
- Compare to objective and select preferred growth direction

Development planning
- Generate new project proposals
- Evaluate proposals against objectives and strategy
- Assign organizational responsibilities

Strategic planning
- Evaluate environmental trends
- Determine opportunities and threats
- Establish corporate philosophy
- Set corporate objectives
- Generate strategic alternatives
- Evaluate and choose alternatives
- Balance the portfolio of alternatives

Capability planning
- Evaluate adequacy of present capabilities
- Determine the ultimate pattern of capabilities and the priorities in transition

Forecasting and competitive analysis data base
- Forecast trends in related demand areas
- Analyze competitive behavior
- Predict competitive behavior

Historical performance data base (usually called "information system")
- Measure past performance
- Interpret past performance

Environmental surveilance and analysis data base
- Forecast discontinuities in related trends
- Forecast trends in unrelated areas
- Interpret trends into threats and opportunities
- Identify unfilled social needs

Capacity and capabilities data base
- Measure resources
- Inventory skills
- Inventory capacities
- Inventory capabilities

All of these demands on the planner have remained, but with the advent of the higher forms of planning, the repertoire of planning tasks grew progressively. Neither the capacity nor the capabilities for these tasks were to be found in existing managers. Thus the planning and control staff had to be expanded in size, scope of its responsibilities, and the range of competence and skills. Table 17.2 presents an up-to-date list of planning work required in a sophisticated entrepreneurial planning system. "Process control" was the original job of the extrapolating long-range planner.

TABLE 17.2 Functions of Planning and Control Staff

Capability development	*Information base*	*Process control*
Design of organizational structure	Environmental surveillance	Coordination of planning
Design of planning systems and procedures	Forecasting	Integration of plans
Management development	Threats and opportunities	Evaluation of planning systems
Revision of planning systems	Capability analysis	Evaluation of plans
Implementation of planning support systems	Generation of alternatives	
Introduction of planning system	Analysis of alternatives	
Performance control	*New venture management*	
Measurement of performance	Identification of opportunities	
Diagnosis of deficiency	Analysis of opportunities	
Generate corrective actions	Acquisition and development of opportunities	
Analyze corrective actions		
Monitor corrective actions		

The list suggests that it is no longer helpful to characterize "the planner" in the singular, that there is more planning work than an individual can handle, and, most important, that the range of work now requires a wide variety of skills rarely found in a single individual. The traditional systems designer–expediter is still needed, but so is the entrepreneurially minded new venture analyst, so is an analytic diagnostician–controller, so is a skilled forecaster–analyst, so is a computer model builder.

Nevertheless, there is still an important distinction to be made between this group of planning workers and the line managers. The responsibilities of the latter, as found in practice, are (a) to see that planning is done on time; (b) to assure that planning, implementation, and control processes operate coherently and effectively, (c) to make the necessary decisions and commitments, (d) to assure translation of plans into practice.

ORGANIZATIONAL FLOW OF PLANNING

There is another planning cliche that says: "The chief executive is the chief planner." This is immediately contradicted by two others: "Strategy is not made in the corporate office," and "To be effective, planning must flow from the bottom up."

In the complex organizational reality the responsibility for different types of decisions is located at different points in the organizational hierarchy. Furthermore,

responsibility for a single major decision is frequently a synthesis of lower level subdivisions.

In the very early days of planning, it appeared that the advent of formal planning would lead to more decisions being made in the corporate office. Early system designers imagined that, eventually, all important planning decisions would be made in the corporate office, thus supporting the first cliche. This solution very quickly proved unworkable in practice. When planning was attempted by the corporate office, the planning process became separated from the realities of day-to-day action; plans were neglected and disregarded by managers responsible for carrying them out; planning became largely an academic exercise.

Through trial and error, a planning concept emerged that directed that plans should be prepared by those responsible for executing them. This new principle produces much better results and has been generally adopted. Application of this principle made it necessary that system decision points be matched to organizational responsibility points. But another problem arises: in what direction should planning flow: from the top of the firm down, or from the bottom up?

To answer this question, we recall that strategic (entrepreneurial and societal) decision making is the *framework* within which operating planning must take place. Thus, the flow must be arranged to take care of strategic planning first and operating planning second. Applying this answer to the divisional form of organization structure, we obtain the sequential flow of planning shown in Figure 17.2, which is today typically found in companies with well-developed planning systems.

A new dimension of complexity arises in the multinational structure, where the concept of divisions is typically replaced by "product groups" and a new structural dimension of "countries" is added. The directional flows of planning of Figure 17.2 are easily enough modified to add the country dimension, but the location of the strategic decision responsibility becomes unclear: both countries and product groups have responsibility as well as important inputs to the strategic decision process.

At present three approaches to resolving the responsibility question are found in practice:

Responsibility for strategic decisions is assigned to product groups; the countries contribute and consult.

Strategic responsibility is shared, and strategic plans are arrived at through negotiation.

Responsibility is assigned according to the relative size and importance of the country market. When it becomes large enough to justify a separate product-line strategy, the responsibility is shifted to the country.

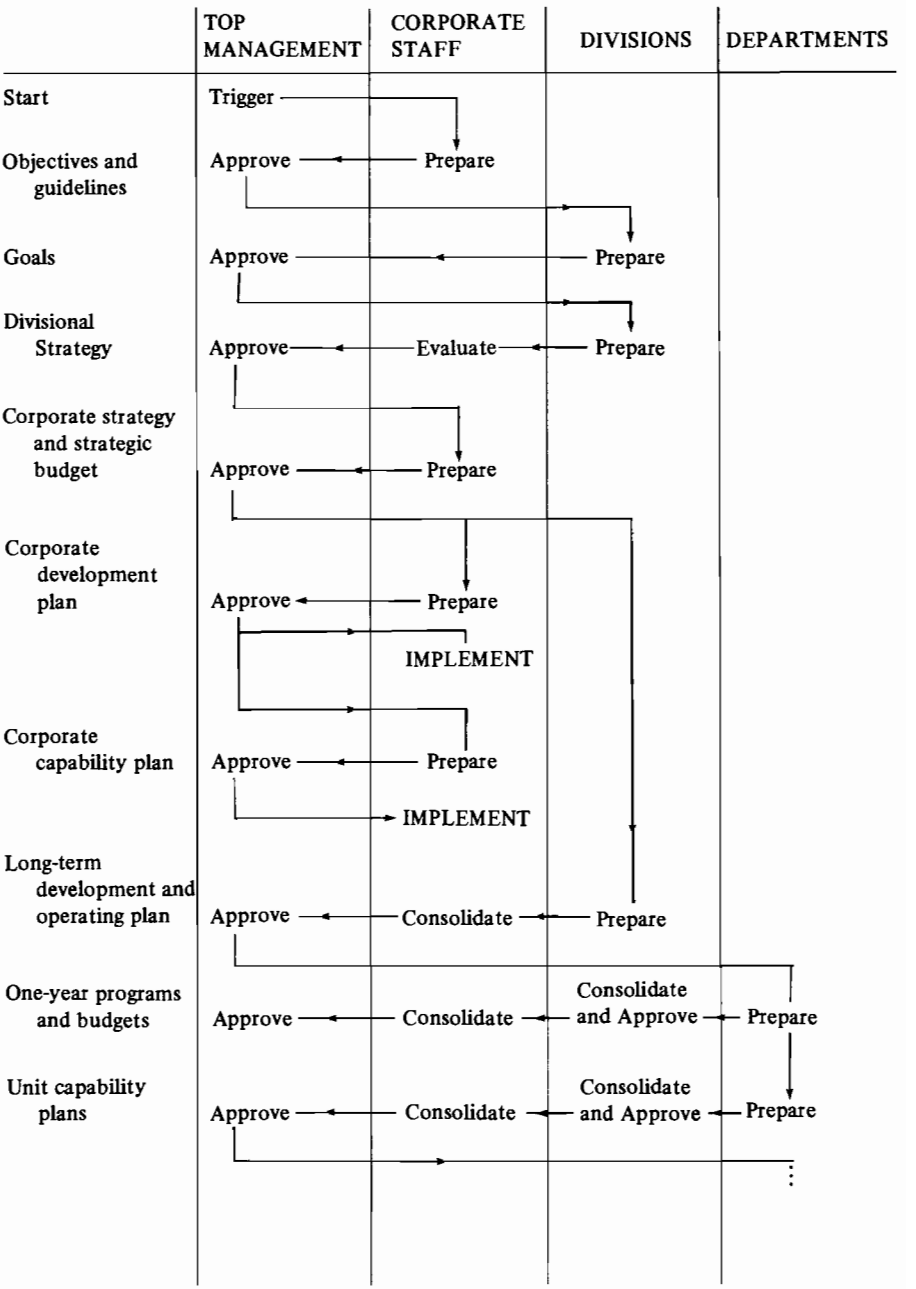


FIGURE 17.2 Flow of planning in divisional organizational structure.

THE HUMAN DIMENSIONS OF SYSTEMS

The very early applications of long-range planning met with "resistance to planning" from both line and staff managers. As systems became more and more sophisticated, the resistance to planning persisted. A most dramatic example occurred in Robert McNamara's struggle with the U.S. defense establishment over introduction of PPBS.

The solution, offered in the planning literature, for overcoming resistance to planning is to secure enthusiastic support for the system from top management. Given the high degree of technological sophistication in modern planning, this is a strangely naive approach to dealing with the human problem: "If managers do not plan willingly, threaten them with the displeasure of the big boss and tell them that he loves planning."

Understanding of the causes of the resistance, and more sophisticated ways of coping with it, is just emerging. It appears that planning is threatening and unwelcome for several fundamental reasons:

It threatens the manager with loss of personal power that he holds by virtue of private knowledge.

It threatens disclosure of incompetence.

It requires new types of information not available within the firm. In the absence of good information, the data inputs are improvised and invented. The planning process, to use information systems jargon, is in danger of GIGO ("garbage in, garbage out").

Most important, it requires a fundamental shift in the manager's outlook from an introverted, historically familiar view of the world to an extroverted, unfamiliar and, therefore, threatening perspective.

This list of shortcomings appears to be contradicted by the already impressive spread of corporate planning and its growing applications. But the list is justified when one looks beyond the statistics.

Typically, introduction of firm-wide planning is a traumatic, turbulent experience. It *does* require top management attention; it does take 3–5 years to arrive at a satisfactory planning process. The process is attended by latent, if not overt, organizational resistance, and, if top management attention lapses too soon, the planning is either rejected or becomes an annual exercise in managerial frustration.

Typically, firms that start with strategic planning "slide back" after a period to the more acceptable and more easily understood extrapolative long-range planning, which does not incur several of the difficulties on the above list. As a result, in spite of almost 20 years of strategic planning technology, very few firms today engage in genuine strategic planning.

On the positive side, planning has become a useful, if not indispensable tool of management. Thus, the negative list of particulars is not an argument against formal management systems, but rather a set of fundamental deficiencies to be remedied.

The directions for remedy are two. The first is to develop a management system design technology that treats the human being and the decision-making technology as equal. A promising approach is through *self-design* in which eventual users and contributors to planning play an active role in the evolution of the system.

A complementary and probably more important direction is to view a management system not as an introduction of new forms and procedures, but as a manifestation of a *cultural change* in the firm, which typically "opens" the firm to the environment. In this approach, a cultural transformation process is applied that effects changes in the complete spectrum of the firm's attributes: the values and norms, the rewards and punishments, the risk attitudes, the managerial skills, the power structure, the organizational structure and, at the appropriate phase and time, the management systems.

In current practice, there is growing understanding of the causes of troubles encountered in introducing planning, as well as of the fact that "systems produce unintended consequences" and of the importance of a cultural transformation. But practical technology to deal with these issues is just emerging.

SUMMARY

We have traced, in an analytic framework, the historical evolution of practical management systems in the United States. While succeeding systems appeared to supersede the preceding ones, the process was actually one of enlargement of the systems repertoire. As a result, an impressive array of systems is available today to assist management in a large range of its activities. At the same time, a building-block technology of tailoring systems to needs is just in the process of developing, with the result that the repertoire is only partially explored in practice.

Progress has been logical, responsive to contemporary needs, and directed in the first phase (1900–1960) toward *comprehensive integrated systems*. We have argued that progress since the 1960s, while still aimed at comprehensiveness, is directed toward *comprehensive, fully connected, but loosely coupled systems*.

The mapping of systems on organizational structure has traditionally followed the principle of wide participation in the development of plans, creating complicated planning flow patterns within the firm. In the complex multinational firm, where unity of authority and responsibility is hard, if not impossible, to preserve, new kinds of planning relationships and new flows are emerging between product groups and country organizations.

The modern system repertoire is essentially one of "unhuman" systems, defined by the logic of management problems, rather than by the needs, deeds and aspirations of human beings. One result of this design approach has been almost invariable organizational resistance to the introduction of systems, resistance, however, that may be overcome through the design of systems that treat human beings and decision-making technology as equal and through the recognition of the cultural change effected in a firm through application of a management system.

18 Organizational Structures and Planning Systems in American Corporations

William D. Guth

This chapter explores the relationships among the strategies, organizational structures, and planning systems of major American industrial corporations. The data underlying the following comments is drawn principally from the 500 largest American industrial corporations. Many of the conclusions drawn from these data, however, are, in a more general sense, applicable to smaller American industrial corporations, and perhaps to nonindustrial corporations as well.

KEY PROPOSITIONS ABOUT RELATIONSHIPS

The key general propositions about the relationships among corporate strategy, organizational structures, and planning systems in American industrial firms are as follows:

1. Corporate strategy is the principal determinant of corporate organizational structure.
2. Corporate organizational structure is the principal determinant of the structure of the corporate operational (short-term) planning system and is a significant determinant of the structure of the corporate strategic (longer-term) planning system.
3. Complex strategies require complex organizational structures – i.e., structures with multiple and overlapping hierarchies of authority and responsibility.
4. Complex organizational structures require complex planning systems, within which considerable amounts of managerial time must be spent in balancing and coordinating conflicting organizational perspectives and interests.

The following sections discuss these relationships, in light of the experience of the 500 largest American industrial corporations over the past 25 years and longer.

STRATEGIES FOR CORPORATE GROWTH

Permeating the psychology of the professional American corporate manager is a drive for growth of the earnings and assets of the corporation that employs him. Even though only very few such managers today have substantial ownership positions in their corporations, the drive for growth persists. Many of the potential rewards for corporate managers, tangible and intangible, are related to the magnitude of their corporations' assets and earnings and thus to the rate of growth in those assets and earnings. The average rate of growth in earnings for the 500 largest American industrial firms from 1960 through 1971 was 7 percent, compounded.

As managers strive for the growth of their corporations, they inevitably face, at various points in the development of their corporations, limitations in the opportunities for growth within the confines of the products currently being produced for sale in the markets currently being served. These limitations may stem from a variety of causes, with the following being among the most common:

1. "Maturation" of the product in the markets being served. Almost 100 percent of American homes, for example, have refrigerators today. Thus, demand for new refrigerators stems now only from new household formations, replacement needs, and from consumer desire to trade up to larger refrigeration capacity, or to additional refrigeration convenience. In contrast to several decades ago, when less than 50 percent of American homes had refrigerators, the growth potential for a corporation in manufacturing and selling refrigerators is quite limited.
2. Additional competition from other corporations entering the market being served with similar products. Even in high-growth product–market areas, growth opportunity for a particular corporation can be limited by the commitment of other corporations to compete more extensively in that product–market area. Some corporate managers purposely limit the profits obtained from particular product–market areas to discourage additional competition, but, in the final analysis, these managers have no control over competitive conditions in their product–market areas, except that inherent in their own competitive strength.
3. Threat of government intervention if the corporation's share of the market becomes so dominant as to be judged monopolistic. Thus, the option of growing by taking market shares away from competing firms is limited, particularly for corporations with already commanding shares of the market.

Before opportunity for further growth in profits from existing products and markets diminishes, the successful corporation typically experiences a period when it accumulates, through profits earned and not distributed to shareholders, financial resources beyond what is needed to support its likely future level of activity in those products and markets. Thus, it often has "excess" financial resources (and sometimes "excess" managerial and technical resources), which

must be either distributed to the shareholders for investment elsewhere, or invested by the corporation in ways that will contribute to further growth in its profits.

There are several possible strategic responses available to corporate managers when faced with only limited opportunity for corporate growth with present products and markets, in comparison with resources available to support further growth:

1. Product modification to stimulate additional demand, or, if the corporation has a minor share of the market, to capture additional market share
2. Penetration of new geographical markets with existing products
3. Development of new products for existing or new markets
4. Acquisition of products, and assets, developed by other corporate managers for addition to the product and asset structure of the acquiring corporation

Product Modification The first alternative, product modification, is effective, in general, when the technologies underlying the product are young and developing. When the underlying technologies are established and mature, however, opportunity for significant growth through product modification is generally more limited, though most American industrial corporations continue to spend a portion of their revenues each year on the search for effective and efficient modifications of existing products.

Penetration of New Geographical Markets The second alternative, penetration of new geographical markets with existing products, has held high prospects for American corporations searching for opportunity for further growth in profits in the past two decades. Direct foreign investment by American corporations (all American corporations) increased from $11.0 billion in 1950 to over $86 billion in 1971, reflecting a compound annual growth rate of just over 10 percent. Earnings of American corporations on their direct investments abroad have enjoyed a slightly higher rate of growth. Not all opportunity for growth in profits from new geographical markets for American corporations, of course, is encompassed by the figures on profit from direct foreign investment. Export of products produced in American factories, with limited or no investment in some foreign countries, still takes place, though its contribution to growth in corporate profits is becoming increasingly less significant as time goes on.

Development of New Products The third alternative, development of new products for existing or new markets and new production processes for existing products, is most effective when the corporation has a highly developed and broad base of technological skills within its existing structure. Typically, larger corporations with a strategic commitment to growth through new product development will spend a relatively fixed portion of their annual revenues on research and development. A portion of these research-and-development funds will be spent on what is called "basic research." This basic research is not oriented to finding the solution to technical problems associated with present products and production

processes, or even to modifying present products, but rather is oriented to study of technological trends, which, at some point in the near future, may lead to the development of new products, or production processes. One corporation with such a strategy, for example, with sales of $500 million in 1974, allocates about 1.25 percent of its annual revenues, or $6.25 million in 1974, to basic research, and 3.75 percent of its revenues, or $18.75 million in 1974, to further development of existing products and production processes or for new products and processes already selected for development.

Acquisition of New Products and Related Assets If the corporate managers decide that they must move into product-market areas far afield from the existing technological base of the corporation, or that they must move quickly into new product-market areas to achieve greater growth opportunity, they will often choose to do so through merger or acquisition, rather than through internal product development. The number of mergers between corporations, and more predominantly, the acquisition of smaller corporations by larger corporations, increased rapidly during the two decades between 1949 and 1969.

By 1949, about 29 percent, or 145, of the 500 largest American industrial firms had remained essentially undiversified – i.e., they derived all or almost all of their revenues from a single product-market area. By 1969, this number had declined to 35, or 7 percent of the total. At the same time, the number of corporations in this group that had diversified to the point where 30 percent or more of their revenues came from product-market areas outside their traditional areas leaped, from 160 in 1949, or 32 percent of the total, to 285, or 57 percent of the total. The percentage of corporations in this group that realized 5–30 percent of their revenues from diversified product-market areas declined, in the same period, from 39 percent to 36 percent.

CORPORATE STRATEGY AS DETERMINANT OF ORGANIZATIONAL STRUCTURE

Data drawn from the largest 500 American industrial firms over the past two decades indicates a strong relationship between strategy and organizational structure. A general theory of the relationship between strategy and structure is outlined in Table 18.1.

As the firm grows in volume of sales and profits, its strategy has to change because of the factors outlined above. As its strategy changes over time, so does its management organizational structure. Organizational structures that were effective and efficient for the earlier strategy prove ineffective or inefficient for the new strategy and eventually are changed to be more consistent with the new strategy.

Examining the 500 largest American industrial corporations over long periods reveals a basic pattern in the evolution of the relationships among growth, strategy,

TABLE 18.1 Some General Relationships among Organizational Volume, Strategy, and Form[a]

	Volumes		
Stage	Strategy Product–Market Scope	Basic Top Management Structure	Transitional Adaption
I	Single product, local market	General manager	Plus general assistants
II	Single product, national market	General manager and functional specialists	If to III a: international department If to III b: product-centered divisions
III a	Single product, multinational markets	General manager and geographically specialized general managers and functional specialists	Add product specialists in marketing
III b	Multiple products, national market	General manager and product-specialized general managers plus functional specialists	Add geographically specialized managers in marketing and production
IV	Multiple products, multiple markets	General manager plus product- and geographically specialized general managers plus functional specialists	Complex and unstable

SOURCE: Based on the concept of "Stages of Corporate Development," originally developed by C. R. Christensen and Bruce Scott, Graduate School of Business Administration, Harvard University. Modified and supplemented by the author after systematic study of 60 American firms over time.

[a] Technically, the relationships shown here are hypothetical; statistical validation is forthcoming.

and organization structure. This evolutionary pattern can best be described by identifying four separate stages, the third of which is broken into two subparts.

STAGE I

When corporations come into existence, their volume of sales and profits, of course, is zero. Assuming that the new product idea that led to the creation of the firm is viable and a market does exist for the product, the corporation's sales and profits will begin to grow, though only rarely in direct relationship one to the other. The typical, though not universal, strategy for the firm involves selling a single product (or product line) to a local market, and then to a larger regional market. In the early stages of this strategy, when the volume of sales and production is low, the management organizational structure typically is simply a single individual who takes responsibility for making all the important decisions for the corporation and for managing all the important relationships between the firm and its customers,

suppliers, workers, bankers, and shareholders. As the firm grows in volume, this management structure becomes increasingly inadequate, as the demands on the time and decision-making capabilities of the single manager exceed his capacity.

The simplest solution to this growing inadequacy of the organization structure is for the manager to hire one or several assistant managers to help him. In the early stages of this solution, the manager allocates his tasks between himself and his assistants, often on a very short-term basis in response to pressures and problems as they arise.

As the Stage I corporation continues to grow, it begins to run out of opportunity for further growth in the local and then regional markets it is serving, due to the "maturing" of these markets, for example. At this point, the manager and his assistants begin looking to other regions for opportunity for growth, with the longer-term objective of achieving coverage of the total national market. This decision to move into new regions for eventual total national market coverage amounts to a change in corporate strategy and marks the transition, according to this model of the evolution of the relationship between strategy and organization structure, to Stage II of corporate development.

STAGE II

In the beginning of Stage II, the firm has just embarked on its strategy of achieving coverage of the national market. By this point, the volume and complexity of the management decision-making and relationship-maintenance tasks has generally exceeded the capacity of the management organization structure, which consists of the manager and his assistants, to cope effectively with them. The approach of simply allocating these tasks to those with time available in the management group as problems arise becomes increasingly difficult and ineffective, as the time available within the group to deal with the tasks decreases and as the complexity of the tasks increases. The organizational solution adopted by most American industrial firms in Stage II of their development is to organize the tasks into groups related to the different functions performed by the firm – e.g., marketing, manufacturing, engineering, finance, hiring and training of personnel, and assigning each assistant manager responsibility for handling one of these groups of tasks. The manager's basic task then becomes one principally of coordinating the activities of the now functionally specialized assistant managers. To relate this description to common titles in American industrial firms, the manager would be called the president, and his assistants would be called vice presidents. When the firm moves to the functionally specialized structure, the vice presidents would add to their title the designation of their functional specialty, for example, Vice President, Manufacturing.

This functionally specialized structure was the dominant type of corporate organization structure for large American industrial firms until some time in the first part of the twentieth century. It has been replaced as the dominant type of

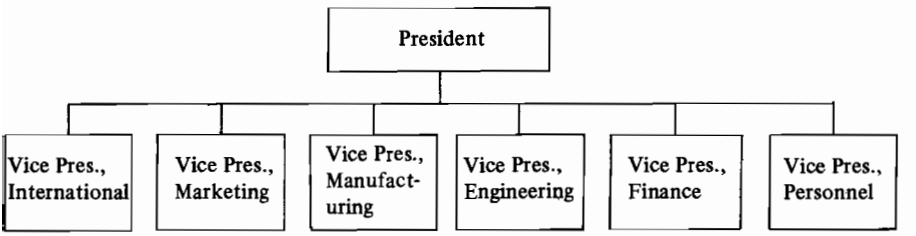


FIGURE 18.1 Organizational structure of a Stage IIIa firm, early in Stage III.

corporate organization structure by more complex structures better suited to the increasingly complex strategies adopted by those managers of large corporations who are successful in their continuous pursuit of corporate growth.

Near the end of Stage II of the firm's evolution, it begins again to run out of additional opportunity for further growth with its single product line in the total national market. Managers of firms near the end of the Stage II then begin to look at one or both of two basic strategic options: (a) to take the firm's single product line to the multinational markets and (b) to diversify in the domestic national market by adding new product lines to the company's structure, either through internal development or through merger with, or acquisition of, other firms. Data from the 500 largest American industrial firms suggests that the managers of most firms moving from Stage II to Stage III of their development chose one or the other of these strategies. Those managers who choose to pursue both strategies simultaneously usually, in fact, impose additional strain on the capabilities of their existing organization structures and thus increase the risk that serious managerial mistakes will be made, with a negative effect on the future performance of the firm.

STAGE III

Stage IIIa

In moving the firm from Stage II into Stage III of its development by adopting the IIIa strategy of penetrating multinational markets with the existing product line, its managers often initially create a geographically specialized department headed by a vice president, at the same organizational level as the functionally specialized vice presidents, who continue to focus their attention on the business done in the domestic market. Figure 18.1 illustrates the corporate top management organizational structure of the Stage IIIa firm at this early stage.

Assuming there is wide and large opportunity for growth for the firm in international markets, the Vice President, International, will soon begin to add assistants to help him in his managerial tasks of identifying the nature and magnitude of opportunity in various parts of the world and in deciding on the myriad of

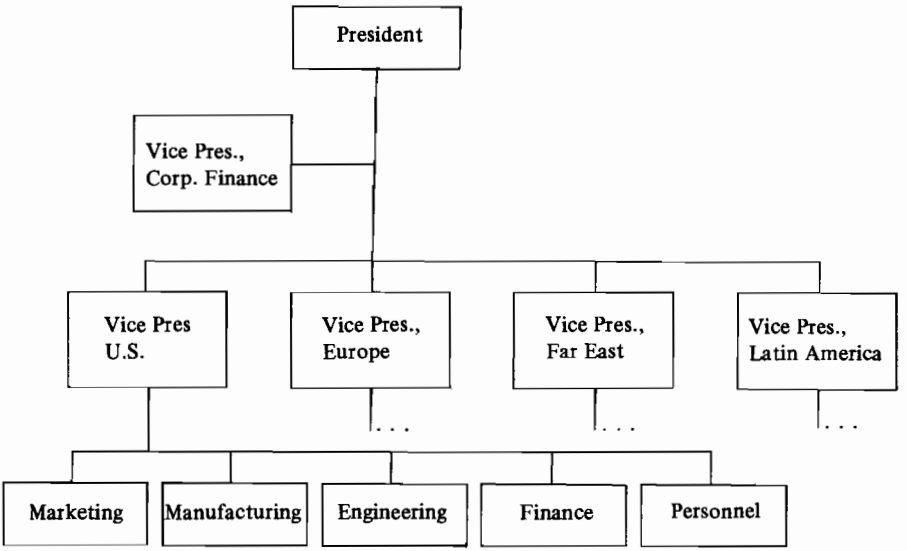


FIGURE 18.2 Organizational structure of a Stage IIIa firm, later in Stage III. The finance function for many geographically structured Stage IIIa firms remains highly centralized, with financial managers of the divisions having only limited decision-making authority concerning the type and sources of financing.

alternative commitments of the limited resources available to him. These assistants will most likely be almost immediately specialized by geographic region of the world, such as Europe, the Far East, and so on. Further additions to his managerial group will be made later, these would be specialized by smaller regions, such as by country in Europe.

As the volume of revenues and profits from international markets increases in relation to the revenues and profits of the total firm, the managerial organizational structure of the early Stage IIIa firm becomes increasingly ineffective because the managerial relationships maintained by the president in this structure are inappropriate to the evolving pattern of revenue and profits. Making the simplistic assumption for the purpose of illustration that the president spends equal time on coordinating the activities of the vice presidents represented in Figure 18.1, he would be able to spend only one-sixth of his time working on the problems brought to him for corporatewide coordination by the Vice President, International. As the ineffectiveness of this structure becomes increasingly apparent, pressures build in the firm to reorganize the management structure along geographic lines.

Thus, the firm later in Stage IIIa typically adopts a geographically specialized corporate management structure, such as, for example, the one represented in Figure 18.2.

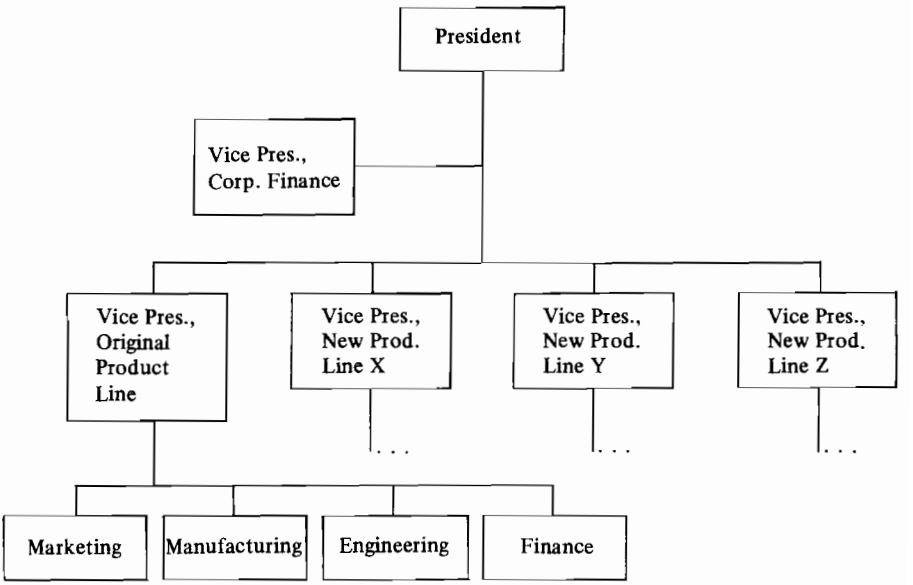


FIGURE 18.3 Organizational structure of a Stage IIIb firm, later in Stage III. The relationship between corporate finance and divisional finance in most Stage IIIb firms is similar to that described for Stage IIIa.

Stage IIIb

The dynamics of the evolution of the Stage IIIb firm, in terms of strategy and organization structure, is similar to that of the Stage IIIa firm. The principal difference in the pattern of development of the two different types of firms, of course, lies in the strategies chosen for future growth. The strategy of the Stage IIIb firm is one of diversification in products rather than markets. The solution to the problem of implementing the Stage IIIb strategy early in Stage III is similar to that of the Stage IIIa firm in all respects, except that the organizational units added to the structure existing at the time are specialized by product, rather than by geographically defined markets. When this solution becomes increasingly recognized as ineffective, for essentially the same reasons as the early Stage IIIa solution becomes recognized as ineffective, the organizational change that results is to a managerial structure specialized along product lines, such as, for example, the one represented in Figure 18.3.

STAGE IV

As managers of Stage III firms begin to perceive limitations in the future growth potential associated with their IIIa or IIIb strategies, they begin to move their

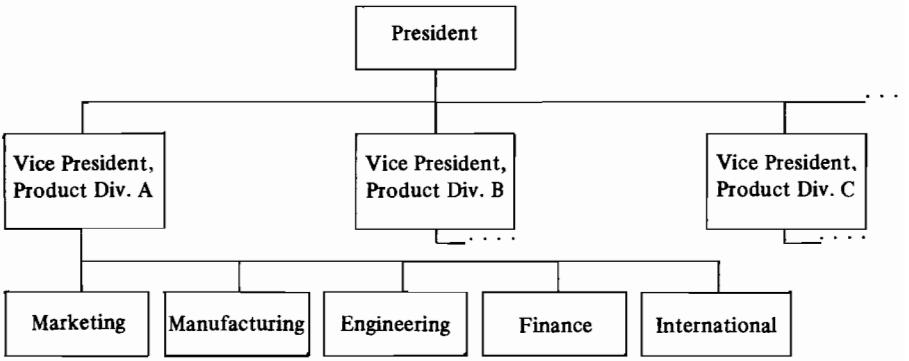


FIGURE 18.4 Organizational structure of a Stage IV firm.

firms into Stage IV of corporate development by adopting a new strategy that involves diversifying in terms of both products and geographically defined markets. The Stage IV strategy is the most complex of all the corporate strategies, requiring the most complex of all the corporate management organizational structures.

According to one sample drawn from those firms classified as well into Stage IV among the 500 largest American industrial firms, over 95 percent of these firms are organized by product-line specialization, with geographically defined market specialization being subordinated to the product-line specialization (Figure 18.4). Interviews with a small, nonstatistically determined sample of managers in Stage IV firms revealed that these managers believe that there are economic advantages to having product specialization dominate regional specialization in the management organizational structure. These economic advantages, in their view, all relate to the cost-saving potentials of worldwide distribution of production of the various product lines. These managers argue that the regionally specialized managers would tend to be too sensitive to the economic needs of their regions to take advantage of what cost-saving potentials existed through worldwide distribution of production.

As criticism of American and other multinational firms increases in various parts of the world, however, there appears to be a growing recognition of the need to give greater weight in the planning and decision-making of Stage IV firms to geographical (regional and national) needs and political pressures. The recognition of this need had led a number of Stage IV firms to alter at least their planning and decision-making processes and, in some instances, their formal corporate management organizational structures. Such alterations in planning and decision-making systems are described in the next section.

The observed alterations in the formal management organizational structure of the Stage IV firm might best be described in general terms as creation of both geographically specialized and product-line-specialized hierarchies in the corporate management structure, with essentially equal formal organizational power. This alteration of the structure releases the geographical specialists from their formal

subordination to the product specialists. Because of this equal organizational power, agreement must be reached between the managers in the two hierarchies before commitments are made and actions taken.

A variant of this approach, requiring less additional managerial personnel, is the establishment of formal regional coordination committees, consisting of representatives from each of the product-line hierarchies whose responsibilities are focused on or in that region. One corporation, for example, that has adopted this approach, and has all of its international business associated with its six product lines in Europe, has established a European Coordinating Committee and six Country Coordinating Committees, one for each of the European countries in which it has a significant volume of present and prospective business. The purpose of these committees, which must meet at least quarterly for several days at a time, is to coordinate and develop the six product-division plans from the regional point of view. While formal procedures for resolving conflict between the product-line and regional points of view have not been made explicit by this corporation, it is clear to managers in the corporation that they must devote more time than in the past to resolving such conflict by rational analytic methods, instead of resolving it simply through the exercise of higher organizational power.

Thus far, this discussion of organizational problems for the corporation in Stage IV of its development has focused on the integration of regional and product-line perspectives built into the management organizational structure. Choice of this focus does not imply that difficulties are not also experienced in achieving integration of functional perspectives with the regional and product-line perspectives. The problems of integrating the plans and perspectives of functionally specialized managers with those of product-line managers have been extensively discussed in American management literature. Today, managers of Stage IV corporations seem more content with their solutions to the integration of the functionally specialized perspective with the product-line specialized perspective than they are with their solutions to the problems of integrating the regionally specialized perspective.

ORGANIZATIONAL STRUCTURE AS DETERMINANT OF PLANNING SYSTEMS

OPERATIONAL PLANNING SYSTEMS

As the foregoing discussion of problems of organizational structure has already illustrated, the American corporation's management organizational structure is the principal determinant of the structure of its operational (short-term) planning system. There is a strong and widely held belief among American managers that for planning to be effective, particularly operational planning, it must be done by the line managers, rather than by staff personnel. Underlying this belief is the widely supported theory that unless the plans are developed by the managers who

will be responsible for implementing them, they will usually not be implemented effectively and efficiently. Thus, though one will see staff planning personnel at several levels in the management organization structures of large American corporations, they are typically limited to providing informational and analytical assistance to the line managers in doing the planning.

In those corporations with complex strategies and organizational structures, particularly Stage IV corporations, there appears to be a growing recognition of the need to modify operational planning systems so that they are no longer completely congruent with the formal organization structure in order to achieve greater integration of specialized managerial perspectives. One concept, initially developed for other purposes, that might be applied to the need for modification of operational planning systems is that of the "matrix organization." This concept applied to operational planning systems would mean that such planning would be done by teams of managers drawn from the line organization in such a manner as to balance the representation from the various organizational line specializations. Behaviorally, these teams would resolve conflicts in organizational interests and perspectives, to the fullest extent possible, by rational analytical means. Operational plans developed and agreed upon by the teams would then be presented to the line organization for implementation.

The concept of "matrix organization and planning," though gaining in acceptance among managers of large American corporations, is still not widely accepted. There are two principal objections to it:

Such an approach would separate responsibility for planning too widely from those who must implement the plans.

Team rational analytic procedures for resolving conflict between specialized organizational interests and perspectives are not well developed.

STRATEGIC PLANNING SYSTEMS

Strategic, or longer-range, planning systems are often not tied as closely to the formal management organization structure as are the operational planning systems in large American corporations. While many large American corporations require the periodic preparation of strategic plans by the line managers for their particular areas of responsibility, the role of the president and his corporatewide staff in shaping those plans is typically greater than is the case with operational plans. The president and his corporatewide staff, for example, must decide, based on their conclusions concerning corporate strategy, how to allocate the corporation's resources. These resources, financial and other, are usually less than the aggregate demand of the line managers for the strategic development of their particular areas of responsibility. Average cost-of-capital cutoff point, ranking of projects by expected return on investment, and net present value are among the approaches useful to corporate managers in coping with the resource allocation problem,

coupled with a concept of the future strategy of the corporation. The corporate-wide allocation-of-resources process normally results in some line managers getting a smaller allocation of resources for strategic development than they want, and some line managers being encouraged to find ways of using more resources than they initially wanted. In addition, corporatewide management often has to do the planning for growth opportunities outside the present product and market areas of corporate activity, since line managers in the existing organization structure may have little to contribute, given the focus of their specialized responsibilities.

CONCLUSION

American industrial corporations, in general, have over the past two decades become significantly larger and more complex in both strategy and organizational structure. If the 500 largest corporations continue to show an annual compound rate of growth in earnings of 7 percent over the next two decades, as they did during the 1960s, the average profits of these corporations will be four times their present level by 1995. While it is impossible to say precisely how much more complex this average (of the largest 500) corporation will be in terms of strategy and organizational structure when its profits are four times their present level, it is safe to conclude that it will be considerably more complex.

Traditional concepts of corporate organization and planning, which served the smaller, less complex corporations of yesterday so well, are already demonstrating their limitations in the larger corporations of today. It seems reasonable to forecast that the limitations of these traditional concepts will become more evident as American corporations continue, as they no doubt will, to grow and become more complex in the future.

At present, the major thrusts in the development of new concepts and approaches to management organization and planning appear to be coming from the fields of applied behavioral science and applied quantitative analysis, utilizing computer technology. The concept of matrix organization and planning promises solutions to already widely recognized problems in organizational structure and planning. It needs further research and development by applied behavioral scientists, particularly to understand and cope better with the fear of separating planning from those who implement the plans, and to develop behavioral procedures for conflict resolution. Already a computer-based "optimization" model has been developed for corporate strategic planning in highly diversified firms. The optimization modeling approach can be more extensively developed in relation to operational planning, as well as to strategic planning. Ultimately, the behavioral scientists and quantitative analysts interested in improving planning and decision making in increasingly complex corporations must integrate their concepts and techniques.

19 A Systematic Framework for Strategy Evaluation

Michael Moses

Any process of strategic planning is dependent on the methods and resources that exist for comparative evaluation of strategic alternatives. In any large or complex organization, the interdependencies and conflicts among strategies proposed by different parts of the organization, generally in response to a corporate directive, require systematic analysis so that these interactions can be fully comprehended in terms of multiple corporate goals and constraints. Rapidly changing external environments, caused by changes in technology, resource availability, consumer preferences or macroeconomic conditions, can cause significant changes in organizational performance. Since these future states of nature cannot be predicted with certainty, especially in a nonplanned, market economy, the analysis of their possible effects must be included in a comprehensive strategic analysis.

This changing environment also often generates opportunities that require rapid responses. Both internal data flows and management response capabilities must be adequate to the task, and both the formulation of problems for strategic analysis and the reporting of results must be understandable to and under the control of the management user. Data required for any analysis must also be readily available, obtainable through normal organizational communication channels and compatible at least in form for all the components that are being analyzed. The process of strategy evaluation must become increasingly systematic and analytical.

In this chapter an analytical framework for strategy evaluation is described; this framework is now being used by the author and others in major corporations in the United States. It includes three interlocking components: the generation of alternative scenarios, development of a user interface for data maintenance and management reporting, and a scheme for analyzing interaction among strategies.

THE STRATEGY EVALUATION SYSTEM

The initial premise was that a corporate manager's ability to understand complex interdependencies among his strategies and to respond precisely to continuing changes in external and internal environments would be improved by the use of a computer-based evaluation system. Such a system should contain, at a minimum, the ability to generate economic scenarios for the economy and for the firm and to investigate their effects on proposed strategic alternatives; the ability to link, from an overall corporate perspective, models of operations of business units within the corporation; the ability for a sophisticated management user to formulate and receive reports on alternative solutions to his strategic planning problem in a language that is readily understandable to him; the ability to collect, edit, and change his data base for strategic planning simply and efficiently; and the ability to compare interdependencies and risks inherent in strategic alternatives using modern analytical techniques.

The *alternative scenario generation* component of the modeling system is composed of two major subcomponents: macroeconomic forecasting and business models for strategic planning units in the corporation. A strategic planning unit (SPU) is the lowest-level unit within the corporation whose manager has responsibility for preparing and implementing a long-range strategy. In many U.S. firms a corporate strategic plan is an aggregate of a set of approved strategic planning unit strategies. The macroeconomic forecasting element permits the user to evaluate the strategies of individual units for consistency with the users' forecast macroeconomic environment.

In most organizations, strategies of single strategic planning units are based on estimates given from the corporate level of a "most likely" future macroeconomic environment. These guidelines are usually part of a statement issued at the start of the planning process and communicated to strategic planning units through normal organizational channels. When plans come in, they need to be evaluated against alternative forecasts for the economy.

The macro forecasting element uses one or more of the available economic forecasting models, such as the Wharton Model or the Data Resources Macro Model, which allow the user to forecast national leading indicators. These national indicators are used to develop relevant industrial or sector indicators from which a model relevant to a particular strategic planning unit may be developed. Such submodels estimate revenues, order volume, manufacturing, labor and materials costs, and other data needed to develop a new version of the strategic unit's strategy. The final element of this subcomponent transforms the new data for the unit into the uniform form used by the entire organization. Depending on budgetary and staffing considerations, a set of these models can be built for each strategic planning unit within a firm or for only the largest or most important ones.

Unit business models give the corporate planner an opportunity to ask "what if?" questions about a variety of operating characteristics, such as market share, revenue, and major components of cost. They also provide a control against suboptimization

by the managers of single units. The unit-level manager too often concentrates on operational or tactical planning for the short term and neglects long-range analysis. His staff is often small and may not be trained to analyze long-range questions. What is optimal from the SPU's point of view may not be best for the corporation as a whole.

The types of models that have been discussed in this section have been developed by many firms, and more detailed descriptions of them can easily be found in the literature.

The *user interface component* of the system controls the use, the internal information flow, and the final reporting of the modeling system. Managerial users interact with the system via a planning language, which is specifically designed to be understandable. The computer mode is almost always interactive, with the communications being carried out in an English-language question/answer dialogue between man and machine. Decisions about what component of the system to use or what steps to take to analyze a particular type of problem are handled by various aids, varying from a sophisticated computerized dictionary/directory to a well-documented user's manual.

The planning language allows the user to interact with only those parts of the system that he is allowed to change. He can enter data, change and edit information, change coefficient and variable specifications, try new techniques, and the like. He usually cannot change major system programs, the permanent data bases, or the logic of the model. Through the planning language, the user sets up a problem analysis by creating a set of "data change files" and specifying the analysis techniques he wants to use by calling forth specific analytical program formats.

The permanent data base is made up of edited versions of all plans submitted by the strategic planning units. The editing process ensures that data are in the right format, balance sheets balance, interest and tax rates are within preassigned ranges, and so on. This editing process protects the user from the risk that suggested solutions will be based on invalid data rather than from the complexities of his problem. Once edited, the permanent data base becomes a "read-only" file and cannot be destroyed or changed by the casual user.

The data base also includes historical information to allow the user to perform trend analysis and comparisons easily. As new data bases are created, using the macroeconomic forecasting models or alternative scenarios for the strategic planning units, and as intermediate or final results worthy of saving are created, they can also be stored by the user in the central data base. Goals and constraints and other basic parameters that corporate management sets to guide the analysis of interactions are also part of the data base.

The final element of the user interface component is the programs that produce reports and graphics for management. The reports are all in standard management form with no translations required. The graphics routines allow the user to graph any result in many different forms and in a quality suitable for presentation. A flexible report generator allows the user to generate reports of his own design or

composition. These types of models have also been developed by many firms, and more detailed descriptions of them can be found in the literature.

The *strategy interaction* component is made up of a set of analytical techniques designed to help the user understand the complex interdependencies and risks inherent in combinations of various units' strategies. Here, we will briefly discuss three generic types of models: financial simulation, resource allocation, and risk analysis.

Most financial simulation models allow the user easily to determine the financial outcome of any user-chosen combination of unit strategies. They allow the user to regroup strategies into new organizational components, make changes in such parameters as tax rates, prime interest rates, or international exchange rates that affect all strategies, and see their effects on corporate performance quickly and easily. Some of the more sophisticated models allow the user to apply econometric relationships between major variables in the generation of new financial statements.

The heart of this component is the corporate-optimization/resource-allocation model. In some very large firms limits on monetary funds, raw material inputs, or managerial talent may restrict capacity to grow or even to survive. Social needs and the reduction of risk exposure may be as important as the historical goal of maximization of profit. Single-product firms may need to diversify, and many large multiproduct firms can no longer manage or support all their activities and thus are forced to consider divestiture. These kinds of factors must be built into strategy evaluation. To comprehend fully the complex interactions and solutions to evaluation problems, managers require the assistance of some form of corporate optimization model. It is only through the analytical power of optimization techniques that interrelationships among competing strategies for scarce resources and conflicts between goals and constraints can be adequately measured and assessed.

Optimization techniques are widely used in many firms for operational or tactical planning but seldom have been used for strategic planning, where they are potentially more powerful. Those techniques that have been used for strategic planning usually take the following form. A single corporate performance measure is chosen by management along with a set of financial, legal, and operational constraints that all have to be met simultaneously. Earnings per share is a popular measure of performance, with minimum or maximum constraints on growth of earnings per share. Other frequently used constraints are return on assets, return on equity, debt-to-equity ratio, assets invested in a particular industry, cash flows, borrowing capacity, and equity market transactions. The user desires to find that subset, if one exists, of strategic planning unit strategies that maximizes the performance measure while meeting all the constraints. If none is found, the goals or constraints must be changed, or new strategies must be generated. If a solution is found, then changes in the constraint restrictions are often made to see how sensitive the solution is to these changes. This is done because most of the restrictions are not inflexible, and for good reason, like increasing performance, they can sometimes be altered. Models of this kind also give the user marginal economic information that is quite useful

in assessing the feasibility of new corporate directions or of significant changes in its balance of activities.

The risks inherent in any corporate strategic plan are one of the most important factors to be considered by a strategy evaluation system. Trying to determine the risk level of a particular unit's strategy is difficult enough; trying to do the same for all combinations of these strategies comes close to being impossible. Some firms avoid this problem by trying to analyze risk on an industry-by-industry basis. Thus the question is how to allocate assets among sets of units operating in industries that have historically demonstrated risk characteristics. Two such characteristics are the mean and standard deviation of return on stockholders' equity. If industry experience can be related to its own planning units, a firm can develop an efficient portfolio, one that maximizes expected return for a given level of variance in that return, by allocating its assets to different industries in the indicated proportions. Once the portfolio for asset allocation has been designed, the risk of each unit's strategy is ignored, since it is assumed that on the average all the chosen strategies will conform to the risks inherent in the efficient portfolio.

Another method is to develop an index of profit probabilities for each strategy and then to pick that subset of strategies that yields the level of confidence about profits required by corporate management. To develop such data at the corporate level requires a familiarity with the underlying economics and markets of each strategic planning unit's strategy that is rarely available. The business model discussed in the next section is designed with the development of these statistics on profit risks in mind.

MODELS FOR DEVELOPING ALTERNATIVE SCENARIOS FOR STRATEGIC PLANNING UNITS

The need to generate alternative operating strategies for strategic planning units at the corporate level has been discussed in the previous sections. With those alternatives, a corporate-level planner can selectively vary operating parameter values of the unit to assess their contribution to the achievement of corporate goals. Our model is basically a simulation model, with added analytical capabilities available for the management user who desires to use them. In this section we will discuss the design and composition of such a business model for the strategic planning unit.

The model was designed to be a time-shared computer model that could answer a set of "what if?" questions posed by a management-oriented user. The questions under the manager's control deal with major changes in

Volume of orders (market share)
Revenues and components of functional costs
Manufacturing delays in long-production-cycle items
Customer delays in desired finished-product delivery dates

Inflation/escalation parameters
Finished-product performance warranties
Methods for allocating fixed costs
Methods for generating fixed cost and capacity data

The model in its current form requires the user to predetermine any new parameter value since the model does not make forecasts, do cost accounting, or try to optimize joint cost allocations. It was assumed that this could be done by other models that could then be easily linked to the current one.

The model is based on "average costs" within groups of production steps and thus was not designed to be a budgeting tool. Its results are approximate but have enough consistency and validity to be very useful for strategic planning purposes. The strategic planning user cares more about gross than about small differences; in cash flow, as an example, he is more concerned about the difference among 4, 40, and 80 million dollars rather than among 40, 42 and 44 million dollars.

The model breaks output products down into projects. Each project will then have a profile containing project-related average prices, costs, fund balances, and order volumes. Expenses for all strategic planning unit services and facilities that are not directly project related are treated as input data. Whether and how these joint costs are allocated to projects is up to the corporate planner using the system. The generic effects of speedups and delays for all project and nonproject data, of warranty provisions, and of capacity additions as a function of volume are also input data. The original set of these data is provided by the strategic planning unit.

The logical flow of information through the model is quite simple. The user

1. Specifies an order volume and delay scenario for all projects
2. Alters project-related price, cost, or balance data for any or all projects
3. Creates a project margin report file for all projects
4. Groups these projects into organizational subdivisions for reporting purposes
5. Calculates or changes data that are not project related, such as capacity and fixed costs as a function of volume and delays previously specified
6. If desired, chooses an allocation procedure for relating fixed costs to organizational subcomponents previously established
7. Chooses reports desired
8. Generates reports and a new strategy form for the strategic planning unit

Calculations done by the model are illustrated by the flow chart in Figure 19.1.

The model is used in an interactive mode with all required changes requested via a question/answer format. The user is free to enter the model at any point and make as many changes as he wants to generate the alternative operating scenarios for the strategic planning unit. The capabilities most often used are those for changing order volumes, delays, and allocation procedures. Especially in times of cash shortages the desire to increase cash flow by reducing market shares or postponing

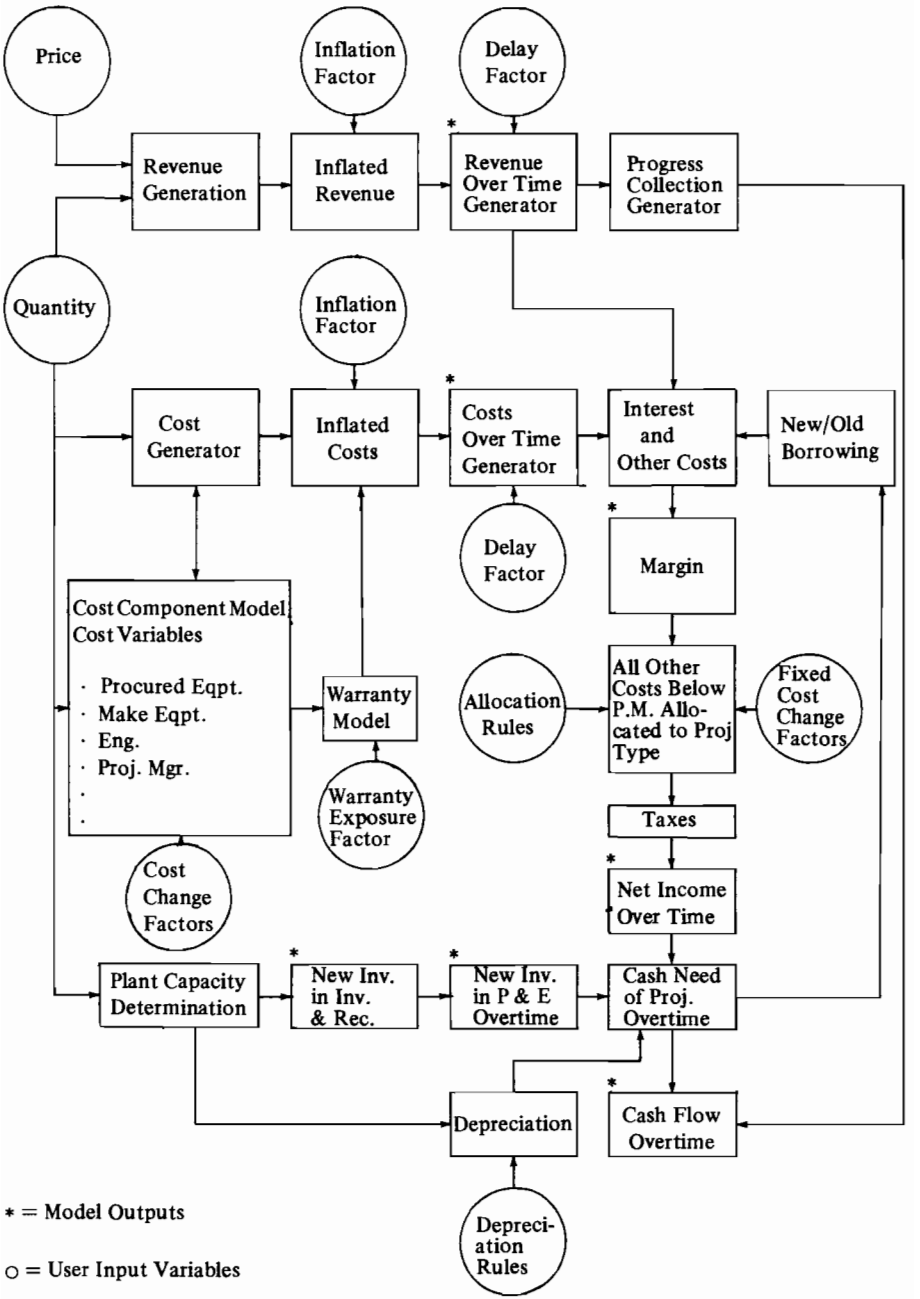


FIGURE 19.1 Strategic planning unit business model: computational flows.

major development project is often a desirable strategic alternative from a corporate viewpoint.

CONCLUSION AND OBSERVATIONS

In a recent survey the use of computer assistance and analysis in the planning process is reported to have increased by over 300 percent in the past 5 years. It is reported that some 350 firms are using or developing computer-based modeling assistance for the strategic planning process. This growth will increase dramatically when, in the not too distant future, a system such as we have described here becomes available for wide use through one of the large time-sharing or computer equipment vendors.

A complex modern organization cannot continue to function successfully by doing strategic planning without the help of a system for evaluating strategic alternatives. The author's personal experience and experiences reported by others at all levels of organization both public and private tend to reinforce this basic premise.

20 Planning in the Multinational Corporation

Robert G. Hawkins

Multinational corporations (MNCs) have more reasons for planning than strictly domestic firms. Problems of communication, control, and integration are much greater when a corporation spans vast distances, several time zones, national boundaries, and cultures. In an MNC, these are strong centrifugal tendencies pulling toward decentralization of management and decision making. Corporate planning may be considered an important tool in resisting these centrifugal forces and achieving a degree of centralization and integration in operations across countries.

This chapter is concerned with the planning process in major MNCs, especially as related to long-term and strategic planning. A relatively restrictive definition of MNC is adopted: MNCs are companies with operating facilities (not only sales offices) in several foreign countries. The production or assets in such foreign facilities contribute a significant proportion to the company's worldwide sales or profits, so that the financial well-being and performance of the MNC system is definitely dependent upon the performance of the firm's foreign operations. The interdependence among units in different countries, finally, is enough that management must take a "global view" (at least for certain major decisions).

This definition would cover a broad range of U.S. companies. For U.S. firms of over $300 million in sales (1971), there were 67 for which foreign operations accounted for 25 percent or more of total operations. There were 84 non-U.S. MNCs in the same category. In almost every case, the firms have foreign operations in 10 or more countries, and approximately one-half have operations in 20 or more foreign locations. The diversity among MNCs takes many dimensions: size (from $300 million to more than $10 billion in total annual turnover); diversification of product line or industry (e.g., Massey-Ferguson as compared with ITT); diversification of geographic location (subsidiaries in other Western countries, subsidiaries in developing countries, or arrangements with Eastern European Socialist countries); age and experience in foreign operations; and many more. Great diversity is also

seen among companies in their managerial structures, styles, and philosophies. Generalizations about MNCs must be heavily qualified and are frequently misleading or wrong.

Diversity is particularly apparent in the long-term planning practices in MNCs. Many MNCs have no *formal* long-term planning apparatus at all. Others have highly integrated planning sequences that employ the most advanced techniques, and they are frequently the leaders in new developments in the state of the art. The concern here is with MNCs that do plan on a fairly formal basis, and that use approximately "state-of-the-art" techniques. By confining the discussion to these MNCs, some limited general tendencies can be identified.*

Besides the planning problems faced by any firm in a capitalist society, including forecasting the economic environment, the MNC faces several additional problems.

1. *Decentralization, communication, and control.* Operation in many foreign locations, with substantial distances and time zone differences, increases the need for autonomy and independence on the part of local affiliates. Differing local customs, business practices, and legal frameworks add to the centrifugal force for decentralization. The complexity brought about by operations in several national environments strains management's capabilities to coordinate activities across national boundaries to an extent far greater than that faced by a multiplant, multiproduct firm operating in only one country.

2. *Differing inflation rates and taxation rates and changes in exchange rate.* The MNC covers operations under several monetary systems, all of which must be consolidated and accounted for in one currency – the currency of the parent. This adds a major element of complexity to corporate planning. For example, different national tax rates that are not fully offset by tax treaties or allowable credits make the location of profits within the MNC system a factor in its total tax bill – and planning for interaffiliate trade and transfers should incorporate these differences.

Likewise, differing rates of inflation in the costs of inputs to internationally traded products will affect the relative profitability of affiliates in various locations. Unless these differences in inflation rates are exactly offset by changes in rates of exchange among currencies, the expected return on investments will depend on relatives rates of inflation. Furthermore, the MNC faces the possibility that one or more of its host countries will experience a balance-of-payments crisis, which may result in depreciation of its currency, the institution of import taxes or controls, exchange controls that may limit remission of profits or fees, or other such policy actions. Such actions would all affect the performance and profitability of the affiliate.

In planning, therefore, the MNC faces higher levels of uncertainty than domestic

* Aside from a very few non-U.S.-based MNCs such as Shell and Nestlé, the practice of long-term corporate planning by MNCs appears to be older and farther advanced among U.S. MNCs.

firms. It must make explicit or implicit forecasts concerning inflation rates, exchange rates, the balance-of-payments positions, and likely policy responses of each of its major host countries – a complexity that the national firm, operating under only one monetary system, does not have to face.

3. *Risk of political and policy changes.* Any firm, whether national or multinational, experiences some element of risk that the political and regulatory environment within which it operates will be changed substantially. The MNC, however, is exposed to such risks to a greater degree than is a national firm. The MNC must take into consideration the probabilities of nationalizations, loss of tax relief, blockage of profit and fee remission, tax changes, and other potential policy actions when planning for capital expansion, acquisitions, and other long-term decisions. The national firm is concerned with radical policy changes in only one country, while the MNC must be concerned with such prospects in each of its host countries. Planners also are likely to be more accurate in predicting political and regulatory changes in their home country than in the several foreign countries in which the MNC operates, with which they are less familiar.

4. *Forms of involvement.* MNCs participate in foreign markets in various ways. Arrangements may involve exports, local production in wholly owned subsidiaries, joint ventures with foreign firms (in which the MNC has majority or minority interest), service and supply contracts, or various combinations of these. The mixtures of involvement permitted under the national regulations of various host countries vary from country to country, and these must be considered in the planning of an MNC's global activities. This variability in the form of foreign activity is a further complication largely absent from the planning purview of the national firm.

These dimensions unique to the MNC compound the complexity of its management and its planning. Yet, as international involvement grows, the potential benefit to the MNC system from coordinated or integrated operations among its foreign components becomes quite sizable. On the other hand, because of the complexity of the task and the necessity to rely on locally acquired experience and expertise, there is a strong tendency for the individual local affiliates to increase their own sphere of influence over their local operations and to try to act independently of other elements in the system. To suppress this tendency toward fragmentation, and to realize the benefits of coordination, many MNCs have, in a sense, felt compelled to establish *formal* planning processes. As a result, many of the pioneers in corporate planning have been MNCs, and many firms have established relatively modern, formal planning procedures for their domestic operations only after they have become multinational.

ORGANIZATIONAL STRUCTURE AND PLANNING STRUCTURE

The planning structure in an MNC is closely related to the firm's structure of organization and control. The integration of the foreign affiliates into the formal

planning process, or even the introduction of a planning sequence, has frequently occurred in conjunction with a reorganization of the management for international operations.

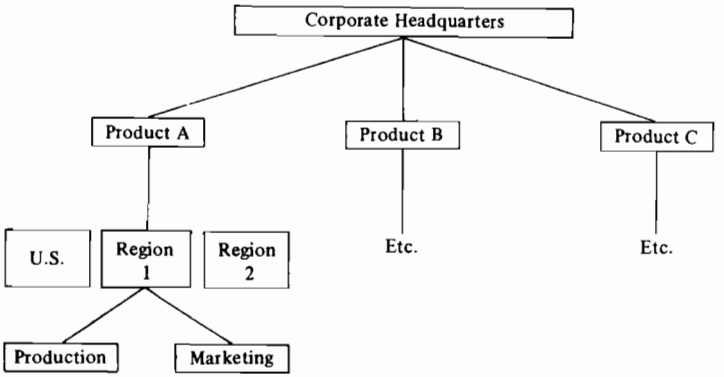
Stopford and Wells, in their study of the evolution of the organizational structures of 170 American MNCs, identified three general forms of organization for foreign operations:

International division. This unit in the parent company provides an "umbrella" to cover all the foreign activities of the MNC. Managers of individual foreign affiliates are responsible to the general manager of the division, who is, in turn, responsible to the president of the MNC system. Below the level of international division, there may be an intervening level of regional or product subdivisions above individual subsidiaries. The international division may provide certain staff or functional services in common for all international subsidiaries, such as finance and control, but responsibility for production and marketing resides with the individual affiliates. This type of structure is normally the first step in integrating foreign operations into the managerial processes of the domestic firm. It usually occurs after foreign operations have become significant contributors to total MNC performance and is frequently triggered by competitive challenges to the MNC's market share or by a crisis in control over relatively independent subsidiaries.

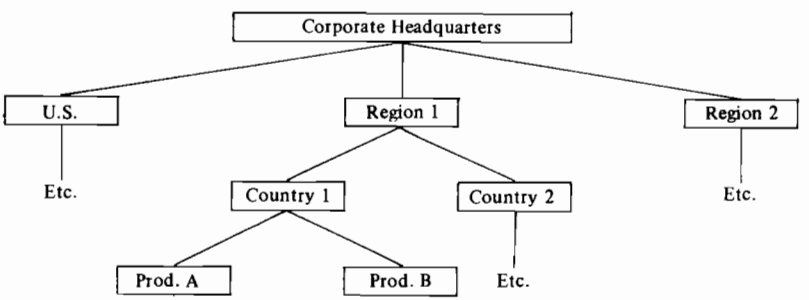
Global structures. The second step in the general evolution of organizational structure for foreign operations usually involves a reorganization to facilitate a "global" perspective for management and control, especially for purposes of long-term planning. The "global structure" takes one of three forms: organizations based on worldwide product groups; those based on regional or area divisions; and those containing a mixture of the two. The structure of authority and control remains hierarchical in these organizational structures, as the simplified diagrams in Figure 20.1 illustrate. In the product-based global structure, the formal communication and control links take very little cognizance of national boundaries. Lines of communication and control run across regions but within the specific product group, and extend up the hierarchy through the product general manager. Aside from informal coordination, mainly within countries among product groups, the formal coordination among product groups is carried out at corporate headquarters. This form of organizational structure is most adapted to, and most used by, MNCs with relatively diverse product lines, but those in which there is much interchange of goods among affiliates in the system, and by MNCs with relatively high technology and/or research-and-development activity.

Development along the *area-based* organization form is frequently an elaboration of the "international division" phase in which an intervening layer of regional headquarters is inserted between individual subsidiaries and the international division. In most instances, the functions of the international division are taken over by the regional managers, who become directly responsible to corporate headquarters. This organizational form appears to be most prevalent in MNCs with

Product-Based Global Structure:



Regional or Area-Based Structure:



Mixed Structure:

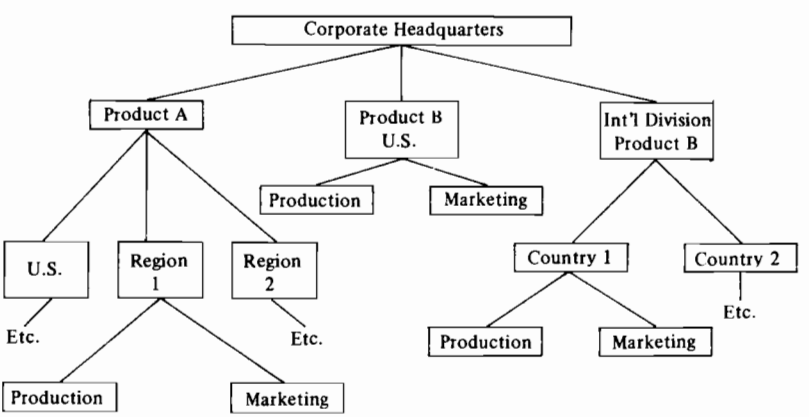


FIGURE 20.1 Three forms of global organizational and planning structure. (Adapted from Stopford and Wells.)

relatively homogeneous product lines and with relatively mature and stable products; usually, the product is closely tied to local consumer markets so that local handling of marketing, service, and production are important requisites for maintaining market share. This organizational structure is more prevalent where there is not much interchange among the affiliates of the MNC.

The "mixed" organization form takes elements from both the product-based and area-based forms. Certain product lines that are particularly amenable to worldwide planning and coordination tend to be organized on a worldwide product basis, while an area-based structure is retained for the other products.

Matrix structure. One of the more recent organizational concepts, designed to avoid some of the limitations of those outlined above and to improve communication and coordination, is the matrix structure. This structure retains both the area and product structures, but imposes multiple reporting and responsibility requirements on individual managers. For example, a subsidiary manager in a given location may be under the direction of both a product-group manager and a regional manager. In addition, staff groups or management committees may be given responsibilities that cut across both the regional and product-group divisions. Although only a few MNCs have instituted a formal "matrix" organizational structure, various aspects of it have been taken over and utilized by firms within the organizational structures mentioned earlier.

The general forms of organization structure of MNCs in the Harvard Study for 1968 are shown in Table 20.1. Over half of the firms still retained the "lower level" international division structure – a structure that is not conducive to integrated planning by the MNC. At the other extreme, only 3 MNCs had formally introduced a true matrix structure. The large, more sophisticated MNCs thus relied most heavily on the various "global" structures, the worldwide-product divisional and the mixed structures predominating over the purely geographical organization.

The organizational structure of the MNC conditions the style and form of corporate planning. Indeed, it has been argued that, for long-term corporate planning, geographically organized MNCs tend to be characterized by substantial decentralization in decision making, national (or local) orientation toward forecasting the economic environment, and "bottom-up" planning. Planning targets

TABLE 20.1 Organizational Form for Foreign Operations of U.S. MNCs

Form	Number of MNCs
With international divisions	90
With global structures	69
Worldwide product divisions	30
Area-based divisions	17
Mixed	22
Grid structures	3

are initiated at the subsidiary level and passed up through the organization for approval, rejection, or amendment. There is little effort, except at the corporate headquarters level, to integrate the plans of the various units.

Firms organized on a worldwide product basis tend to be quite centralized, with decision-making power retained at the top and with a global view taken of strategy and planning, sometimes at the expense of inputs from local managers concerning the business environment. Planning in this type of firm is frequently "top down," as overall MNC targets are developed at corporate headquarters and distributed across product groups, where managers further subdivide the targets along subsidiary and individual product lines. Inputs from the subsidiary level occur during the negotiations over its share of the initial global plan, after which adjustments may filter back up the hierarchy.

The matrix pattern and, to a lesser extent, the mixed pattern of organization are characterized by intensive interactions, both horizontally and vertically, among managerial units in the structure. This permits not only centralized coordination but also the free flow of informational inputs from all levels, including the local subsidiary. The formulation of plans in this context would, ideally, involve both top-down and bottom-up flow and integration of informational inputs. Thus, regional and product structures would be developed simultaneously in the planning process, to be integrated at the headquarters level through several iterations of negotiations with groups of intermediate- and lower level executives.

It has been argued that the matrix structure and its associated planning process represent the preferred form for large multinational firms. Yet an apparent general tendency exists among MNCs, regardless of organizational form, toward definite centralization of the strategic planning process, even in regionally oriented management structures. As noted above, this centralization in the planning process may be viewed as a response to the forces of decentralization that foreign operations carry with them and as a strong tool for regaining control and accountability over the subsidiary network.

THE PLANNING PROCEDURE

MNCs structure their planning process with certain emphases to reflect the special types of environmental conditions with which the MNC must contend.

TIME STRUCTURE OF MNC PLANS

Most formal corporate plans, including those of MNCs, have a future horizon of 3 to 10 years, with 5 years being common. Typically, the entire time structure is "rolled forward" annually, so that the long-term plan is always for 5 years. Most MNCs make the first 1 or 2 years of the plan an operating budget or guide at the detailed product or plant level.

The length of the planning horizon depends upon several factors. Important ones appear to be the "gestation period" of new capital projects and new product development. Thus, the planning horizon tends to be longest for MNCs intensive in R&D and capital investment.

SPECIFICATION OF TARGETS

One function of formal planning is to give precision to the longer term objectives of the MNCs and to provide an operational guide for fulfilling those objectives. Yet the coverage and form of the objectives vary greatly among firms. In general, the broad objectives are given by the president or corporate headquarters for overall MNC performance, although these are occasionally disaggregated in planning for MNCs. Four broad types of long-term objectives frequently appear at the initial phase. Two of these deal with the performance of the MNC. One set typically concerns financial performance, including quantified target rates of return on investment, return on shareholders' equity, return on sales, cash flow growth, and similar variables. The second set of performance variables typically involves the size of the firm or its market share. These may include targets for sales growth, for market share in particular lines or areas, or other measures.

The other two types of objectives, which appear less frequently, are more qualitative. One concerns product diversification or development. While this may sometimes be quantified precisely (such as a percentage of sales in various product lines), it is normally left as a more vague, qualitative target, to be considered when allocating research and development and capital expansion budgets across product lines, or perhaps in setting merger and acquisition policy. Particularly important for MNC planning is the fourth type of objective – that of geographic diversification. This is important in the international context because of the variability in the policies of host countries and their implications for the risk of foreign operations. In a few instances, corporate objectives are defined so as to include this aspect.

PLANS AND PERFORMANCE EVALUATION

An inherent conflict exists in the use of planning and plan fulfillment as a tool in appraising managerial performance. The plan is developed upon assumptions about an uncertain future, and deviations in the environment from the assumptions should not be a basis for penalties or rewards for departures from the plan's objectives. Those deviations, though, make typical measures of performance such as accounting profits or accounting costs notoriously deficient in a multinational context. Some MNCs do compare actual performance with plan targets as one (of several) basis for the evaluation of executive and subsidiary performance, but this tends to be relatively rare.

ROLES OF STAFF AND LINE PERSONNEL IN PLANNING

It is frequently emphasized that line personnel must be intimately involved in the setting of objectives and conversion of these into operating guidelines. The execution of the plan and the attainment of the objectives depend ultimately upon the line managers. Plans must thus be considered realistic by those managers, particularly for the MNC, whose managers operate in many foreign environments.

But in opposition to this view is the fact that planning requires specialized expertise that line managers may not have. It also requires a continuity of effort that is easier to achieve if someone has direct responsibility for the process itself. Thus, MNCs that have instituted formal planning processes have generally established specialized planning units (or individuals) to initiate the planning process and provide guidance and coordination for the line personnel involved. They also ensure that the planning process is actually completed on schedule. As the planning process matures, the role of the specialized planning units may shrink, but rarely do they disappear. Thus, the typical MNC finds the planning procedure carried out by a combination of line and specialized staff personnel (at various levels) whose relative importance differs widely among MNCs.

AN MNC PLANNING SCENARIO

It will facilitate the understanding of the more common ingredients of the MNC planning process if we describe a hypothetical planning cycle for a large MNC. This description draws upon the practices of several firms. We seek the "typical" characteristics rather than specific details.

Let us suppose that this "typical" MNC is a relatively diversified manufacturer of consumer goods, with operations in 20 or more countries. It is organized internationally on a regional basis with four regional headquarters coordinating the activities of the national managers or subsidiary managers. The U.S. market represents the fifth region. The plan uses a 5-year time horizon, the first year of which becomes the operating budget for the following year. Deviations from the previous year's budget provide a basis for incentive payments, and deviations of greater than 10 percent (over or under) must be accounted for in writing in the current year's plan.

The planning cycle begins 6 months before the end of the fiscal year. The first step consists of the issuance of the corporate targets for the next 5-year period by the president of the MNC system. These targets include return on stockholders' equity, return on fixed investment, profit growth, maximum negative cash flow, and qualitative statements on merger and acquisition goals and expansions into new product areas. The broad targets are thus "top-down," with little consultation among levels in the line organization.

The overall corporate objectives are divided among the various regional headquarters (including the domestic division) by a corporate staff committee, which

includes the managing officers of each division, the head of the planning staff at headquarters, and representatives of other staff functions (e.g., the treasurer). The international regional headquarters then subdivides its targets among the national operating subsidiaries, at this point retaining the form of the earlier targets but quantifying the aggregate sales targets for each country manager. This quantification is made on the basis of initial projections of the economic growth in each market, carried out by the staff of the regional headquarters. The overall environmental assumptions to be used in planning at the national subsidiary level are also issued and transmitted by the regional headquarters.

The national subsidiary managers take the objectives and assumptions from regional headquarters, add additional detail to the assumptions to reflect local economic conditions, and prepare goals for each of the product managers for that national market. Using inputs from the sales force and the marketing managers and their staffs, the product managers develop estimates of demand, price, and cost for each product over the 5-year period. These are used to produce profit forecasts. The sales estimates, in turn, are used to generate working capital, fixed investment, and manpower requirements. They also are the basis for an estimate of cash flow. The detail in the plan is thus initially supplied at the product level in each national subsidiary – an example of bottom-up planning.

The staff at the national subsidiary level, 3 months after the start of the sequence, reviews and suggests alterations in the plans of the various product units, integrates them, and arrives at subsidiarywide projections for the various items, including capital expansion, manpower requirements, profits, and cash flow. It is at this point that the regional headquarters enters the picture. A so-called "flying squad" of line executives who have been given planning responsibilities by regional headquarters visit the local national subsidiary to review the subsidiary's initial plan carefully. They recommend amendments and changes. This review is basically to (a) maintain some consistency among the plans for the national subsidiaries in the region; and (b) to avoid having coalitions of local executives introduce unrealistically conservative local targets, since bonuses and performance appraisal use planned magnitudes as the performance standard. Usually, the suggestions for change made by the "flying squad" are incorporated.

Once the adjustments are made, the national subsidiary plans are given to regional headquarters, where they are reviewed, this time by a staff committee from corporate headquarters. After review, and sometimes adjustment, the subsidiary plans are aggregated into the plan for the regional headquarters, which is submitted to the corporate headquarters. A final review and further aggregation at the corporate level is carried out, just before the beginning of the new fiscal year.

The planning cycle thus occupies about 6 months, and is carried out mainly by line personnel, but with staff planners also heavily involved. The latter see that the planning schedules are met and assist in articulating the objectives and the assumptions in operational terms. They also are concerned with the internal consistency of the various components so that the aggregation of the components

will result in satisfaction of the targets laid down by corporate headquarters. The planning staff at corporate and regional headquarters maintains a computerized reporting system, to check actual against the planned performance and to carry out various sensitivity tests and parameter estimates to increase the realism of the planning assumptions and targets.

As noted earlier, this scenario is not applicable to all MNCs, but is a stylized synthesis of the "typical" practices of MNCs at the leading edge of planning practice. Each MNC has developed its own style of planning. The styles reflect such things as the type of product line, the lead time required in bringing new capacity or products on stream, the closeness with which sales are tied to marketing and distribution facilities, and other firm-specific characteristics. Yet in almost all cases, the objectives in MNCs come from the top down; the detail of the plans is developed from the bottom up to fit those targets. But the responsibility for review and alteration comes from above at each step in the hierarchy. The planning process is thus used as an important means of centralizing control.

FORECASTING THE FOREIGN ENVIRONMENT

In developing production and cost flow targets for product lines and subsidiaries at the national level, the MNC planning process faces the additional complexity of forecasting the foreign business environment. Such forecasts are a critical element in the overall planning process. Realistic forecasts of economic and political conditions are essential if long- or short-term planning is to provide a believable operational guide to decision making.

Three relatively distinct issues must be considered by the typical MNC in its planning for foreign operations: the political and regulatory environment abroad; the economic situation; and the context of negotiations with foreign governments over the terms and conditions of doing business.

PREDICTING THE POLITICAL AND POLICY ENVIRONMENT

MNCs must take into consideration the attitudes of the many foreign governments under which they operate toward the operations of foreign firms, as well as the actual and potential policies of those governments toward MNC operations. In addition, the interaction of host governments with each other in multinational bodies such as the United Nations Conference on Trade and Development (UNCTAD), the Organization of Petroleum Exporting Countries (OPEC), or the Andean Pact may result in common postures by several governments that are even harder to predict in a dynamic context. But for long-term planning, such issues cannot be ignored. The "safety" of MNC investment from expropriation, the expected rate of return, and the risk and uncertainty associated with that return, are all governed to a major degree by the political and policy environment in the

host country. Thus, long-term planning for capacity expansion, for deciding where to locate increased capacity (or where to decrease capacity), and for choosing the form (whether to produce, export, or license) by which various markets are to be served requires assessments of the political environment in the several countries.

Unfortunately, the rigor, sophistication, and reliability of political and policy predictions is not great. The most typical type of "forecast" is highly subjective and judgmental, and is carried out by corporate management or the planning staff. For countries in which the MNC has affiliates, the political forecasts are frequently made or heavily influenced by the local MNC management. Forecasts of "political climate" are frequently a mere extrapolation of either the existing situation in a particular country or of the observed trend. This yields acceptable results for countries that are politically stable or are undergoing a slow and predictable business policy transition, but for a sizable number of host countries, such stable business–government environments do not exist.

MNCs that use more systematic methods of developing "political climate" assessments, although still quite qualitative (as opposed to quantitative), tend to use sources like these:

1. Preparation of political and policy profiles, with projections over 3–7 years, of the main countries of interest to the firm, by the corporate headquarters staff. This is often done by an economic research department and less frequently by the planning section or a staff section in the international division. Local subsidiary managements may provide factual and outlook assessments, but their involvement depends upon how well the subsidiaries are integrated into the planning process, the country coverage of subsidiaries, and other characteristics specific to the firm.

In a few instances, quantitative techniques are employed to analyze underlying trends in the political sentiment. For example, these may involve the empirical analysis of the voting records of legislators or of the disposition of administrative or regulatory decisions that are considered to reflect the underlying attitudes of the government toward foreign business. This type of "trend analysis" serves as one of several inputs for the projection of the investment climate in the countries of interest. In the usual case, MNC planners will leave the policy forecasts in completely qualitative terms. A few MNCs, however, establish rankings or scale measurements to allow cross-country comparisons of investment climates (albeit on qualitative variables) that can be integrated with forecasts of the more strictly economic variables.

2. A few MNCs use some form of Delphi technique in assessing prospective political climates. In this method, experts inside and outside the firm are asked their opinions about the various countries of interest, are confronted with the opinions of other experts, and asked to modify earlier views in light of the opinions of the others, with the hope of arriving at a consensus view or ranking.

3. Another important source of information for investment climate projection for individual countries is a by-product of investment project appraisals carried

out by the firm. Most major capital projects abroad require heavy documentation covering expected performance. This is frequently backed up with a thorough country study, covering both the economic and political outlook. For MNCs with investments in several countries, the portfolio of country information and outlooks developed from special project appraisals may become extensive and, when coordinated properly, may provide another important input for the formal planning process.

This list of methods for the projection of the political and regulatory climate is meant to be indicative, not exhaustive. As noted earlier, there appears to be a general tendency to centralize such activities, and perhaps to rely less on the predictions and expertise of local managers and more on a core of specialists in various staff positions (although not always on the planning staff).

The initial information required for any forecast of the investment climate is, of course, an inventory of existing policies and regulations applying to foreign investors in the countries of interest. Aside from information from its own subsidiary network, MNCs have access to and utilize fairly heavily the extensive information bases supplied by several outside sources. For U.S. MNCs, external sources will include various U.S. Government sources (e.g., Overseas Business Reports); standard reference services supplied by international law firms, accounting firms, and management consultants (e.g., Ernst and Ernst Foreign Business Regulations or Business International Country Reports); and perhaps to a lesser extent country appraisals by the firm's commercial and merchant bankers. Most such services provide current and retrospective information and analyses and give less emphasis to prospective developments. They are, however, important sources of information (and sometimes of opinion) for the planning process.

FORECASTING THE ECONOMIC SITUATION

The second type of forecasts needed for MNC planning, and the implementation of plans, are more directly economic in nature. These are, perhaps, relatively more pertinent for the short- and intermediate-term planning cycle, while political regulatory forecasts may be relatively more important for the long-term segment.

The MNC needs two basic types of economic forecasts or projections. The first is the macroeconomic performance of the several foreign markets or host countries of concern to the MNC. To be more precise, the MNC planner is concerned with the expected size of various markets for products and the availability of inputs – perhaps as influenced by real income, income per capita, degree of industrialization, labor supply and labor costs, and availability and cost of exploitable raw materials or primary products, among other variables.

There are many ways to develop macroforecasts. And, as with forecasting the political–regulatory environment, the longer the time horizon, the fewer and less

reliable are the available techniques. It is most common for large MNCs to utilize their own economic research departments as the major source of information, and such forecasts may range from very qualitative and judgmental extrapolations of past trends to highly quantitative forecasts based on large-scale econometric models of particular countries, regions, or markets. In some MNCs, the planning unit staff supplements such general forecasts or outlooks from the economic research staff by preparing additional, specialized forecasts itself or by contracting with outside researchers or management consultants for specialized studies.

The available inputs for such forecasts are voluminous. Several econometric models of world trade are available (the IMF model, the OECD model, and others). In addition, several periodic forecasts from econometric models are made for most major countries (the OECD, for example), and at least one set of national models are "linked" to observe interactions among the national economies. Also, various business advisory services (e.g., Economist Intelligence Unit, Business International, the American Management Association) provide basic information on economic trends in most countries, including commentary and analyses, as do several major banks and financial institutions.

But all these sources are better at hindsight and the interpretation of current events than they are at foresight. Indeed, forecasts themselves must be created by the MNC. In a few firms this may involve detailed, disaggregated forecasts of an extensive set of variables on both the input side and on the demand side for various countries. In some instances, input–output tables are employed, in conjunction with aggregate forecasts of demand based on parameter estimates from econometric models. Such levels of detail and technique are relatively uncommon, however.

The second broad subject requiring forecasts of economic magnitudes for planning purposes is exchange rates and foreign exchange controls and inflation rates. These magnitudes are important for long-term planning in that the return and risk on capital expansion is affected by such variables; and for short-term planning they are important because the setting of transfer prices, lending and borrowing among affiliates, and similar financial transactions may significantly affect reported profits, the MNC's total tax bill, and the ability of its profits to be remitted.

The forecasting of inflation rates at the aggregate level, if it is done at all, is commonly carried out within the context of the macroeconomic forecasts described above. In addition, some MNCs (especially in narrow product lines or primary commodities, such as petroleum MNCs) make detailed world price forecasts for their principal outputs and inputs over various time spans into the future. These are normally done on the basis of econometrically estimated parameters on past data and certain variables projected into the future, within the context of macroeconomic projections.

Forecasts of exchange rates and exchange control situations, especially those beyond the 1-year time frame, are more complex and must usually be done indirectly. Exchange rate adjustments in host (or source) countries and pressures

for policies to restrict free currency convertibility ordinarily arise because of balance-of-payments disequilibrium. MNCs thus typically carry out thorough analyses, and in many cases projections, of the balance-of-payments positions of host countries in which it is interested. This involves analysis and projection of export receipts (sometimes disaggregated by region and commodity group) and projection of imports. The latter is often linked closely with the macroeconomic forecasts described earlier.

A second requirement in forecasts of balance-of-payments positions, especially among developing countries, is careful appraisal of the magnitude and characteristics of the country's external debt. This governs the external debt service payments, which are a relatively substantial component of foreign payments for several countries. Thus, the volume, average duration, interest charges, and other characteristics of external borrowing are used to predict the annual debt service payments in the future. A further component of the balance-of-payments forecast is the net capital inflows or outflows. This is, perhaps, the most difficult to predict, especially for major countries, since the year-to-year variations are large and the connections with projectible variables notoriously loose. These have become even more troublesome with the 1973–1974 change in oil prices and the uncertainty over petrodollar flows. A final piece of information in the balance-of-payments projection concerns the level, composition, and potential additions to the international reserve stock of the various countries.

The monitoring of balance-of-payments and reserve holdings of a broad range of countries is carried out by the economic research departments of many MNCs. The actual forecasting of such balance-of-payments and reserve developments is, however, relatively rare. Several MNCs (and financial institutions) have developed simple mathematical models designed to provide "early warnings" of impending balance-of-payments (and exchange rate) difficulties. In several instances, these are computerized and updated quarterly or semiannually. By using mechanical linkages between various magnitudes and ratios, such analyses attempt to spot incipient balance-of-payments problems before they become obvious. Other firms have developed qualitative rating systems to characterize the balance-of-payments (or exchange rate) outlook for each country, and thereby implicitly forecast the likelihood of currency adjustments or exchange restrictions.

Some MNCs do not, however, perform these economic assessments internally, but acquire short-term analyses from specialized consulting firms, business advisory services, or financial institutions. Even those MNCs that prepare forecasts in-house utilize one or more external services as a source of information, and as a supplement or cross-check for their own forecasts.

In a few MNCs, explicit forecasts of exchange rates, tax rates, exchange controls, and similar variables are incorporated into a quantitative model of the MNC for planning purposes. Normally, such models are linear programming (optimization) models. In the MNC planning context, they are useful in simulating the results of differing corporate strategies (e.g., capital expansion patterns) under several

alternative forecasts of relative inflation rates, currency exchange rates, market growth, and the like. Such models also permit sensitivity analyses to establish the sensitivity of the MNC performance to exchange rate and tax rate assumptions, or to the forecasts of certain market size or input price variables. In conjunction with the more usual capital budgeting models, such simulations and sensitivity analyses performed on the forecasts of the foreign business environment permit a more informed process of long-term planning.

At the short end of the planning spectrum, several MNCs and a few major banks have developed models for planning and executing the cash management of MNCs so as to minimize the cost of financing working capital and to reduce the risk of foreign exchange loss. As is true of all such models, their value rests mainly in systematizing the compilation and use of short-term forecasts of the relevant variables – exchange rates and interest rates. There are a sizable number of U.S. MNCs that have their own planning personnel, but that have contracted for the services and the models of banks or other service organizations. This is, perhaps, an indication that the more specialized planning functions of the MNC may be amenable to contracting to outside services, thereby leaving the corporate headquarters planning staff with fewer tactical planning problems.

A third major type of forecasting needed by MNCs in formulating long-term plans is the firm's market position, or market share, in the areas it serves, relative to the total market or to the share of its competitors. Most major MNCs are in (one or more) oligopolistic or imperfectly competitive markets served by other MNCs of various national origin. Forecasts of the size of the market, the availability and cost of inputs, exchange rates, exchange controls, and tax rates, while essential to the MNC planning process, are of little value unless the MNC's own share in the total market is also predictable. Indeed, much of the need for planning can be traced to efforts to maintain or raise the market share of the MNC. Furthermore, whether explicitly or implicitly, MNC planning does appear to take into account the actions and responses of competitors. Thus, the observed "leapfrogging" and "follow-the-leader" behavior of MNCs in establishing affiliates abroad can be considered as an important case in which the planned expansion of MNCs responded directly to the actions of other MNCs in the same industry. On the other hand, the heavily overoptimistic growth rate and profitability objectives projected by several MNCs in the 1960s were often unrealistic because the actions of competitors were not adequately or accurately taken into account.

To devise meaningful forecasts of market share is no easy task. The theory of oligopolistic firm behavior, while meaningful in certain contexts, is not very helpful in forecasting the results of alternative planned actions. Yet this is precisely the type of information needed by MNC planners. Certain types of models are used by a few MNCs. Perhaps the most prevalent are models (mainly regression-based estimators) to assess the impact on market-share variables of alternative levels of sales promotion, research and development, distribution and service networks; and other such variables. These are directly relevant for planning of facilities and

expenditures on these functions in the MNC. Much less frequently used are game-theoretic models as an aid in determining the results of various strategies and mixtures of reactions by the MNC and its competitors. In cases where such models are employed, alternative strategies are simulated, and the outcomes provide indications of the future share (and probabilities) of the MNC. This becomes one of several pieces of information employed in the formal planning process. In general however, this area of forecasting is less developed than the others described above.

PLANNING FOR NEGOTIATIONS BETWEEN THE MNC AND THE HOST GOVERNMENT

Major changes in the past few years in the relationship between the host governments and MNCs have added to the complexity of MNC planning, but have also added to the need for such planning. New governmental requirements relating to entry of an MNC into the national market, to the form of its involvement in that market, and to its operations after establishment have made it essential that the MNC examine alternatives more carefully and systematically than in the past. The number of variables has increased as the importance of the wholly owned subsidiary has receded.

One of the requirements imposed by the new environment in international business, which encompasses MNC relations with many developing countries, the centrally planned economies, and several advanced market economies (e.g., Canada), is that the MNC provide detailed analyses and information relating to the prospective operations of the firm and its benefits (or costs) to the host economy. There is a particularly strong requirement along these lines in the new Canadian foreign investment law, but similar requirements exist in Mexico, the signatories of the Andean Pact, and several other countries. These informational requirements and "forecasts" parallel, at the specific project level, the firm planning process at the more aggregate level.

A more important aspect of the assertion of the interests of host countries is the tendency for MNCs and host governments to engage in relatively continuous (or at least frequent) negotiations over the terms and conditions for doing business. It has been argued that the pragmatic, flexible, and discretionary policies of most developing countries and the centrally planned economies toward foreign investors give rise to repeated renegotiations of the conditions for a given project over its lifetime. While the negotiations may be frequent, the items under negotiation tend to change in a predictable way over the life of the project. This occurs because the relative bargaining position of the MNC and the host country change, perhaps as a result of changes in local or world market conditions, or because the local scarcity of some of the MNC's services may be alleviated. As the relative share of developing countries and centrally planned economies in the total foreign operations of MNCs rises, and as more countries adopt a stance of flexible conditions

for the entry, equity holdings, and operational requirements of foreign firms, MNCs face a situation in which ever more of the operating environment is subject to negotiation. The negotiations themselves thus become a subject of corporate planning, but at the same time they must reflect the plan objectives once they are made.

Long-term corporate plans cannot, of course, incorporate the details of acceptable terms and conditions of negotiated projects, such as joint ventures or service contracts. Strategic plans should, however, articulate the general strategy for negotiations and the general forms and mixtures of involvement that are acceptable for corporate objectives. In brief, the long-term plan should provide general guidance for and a framework within which the planning for specific negotiations can be carried out.

For short or intermediate plans, the specifics of negotiated projects do become a matter of interest. On the one hand, the MNC must establish the minimum acceptable terms for alternative projects that may arise. This is sometimes quite complex, since the number of components that can be altered is great (e.g., percent of equity, size of the project, length of tax holidays, repatriation limits, export limits or requirements, import preferences), and the play-off of one component against the other is difficult to establish. Some MNCs utilize rather advanced forms of cost–benefit analysis for appraisals of alternative projects in order to provide guidance as to the minimum acceptable terms for the firm. In relatively rare instances, however, are these formalized in the corporate plans.

On the other hand, the MNC wants to negotiate a set of terms for its various projects that is above the minimum acceptable and, indeed, as close as possible to the minimum terms which the host country will accept. Estimating the latter requires that the MNC carry out a separate cost–benefit calculation from the perspective of the host country's objectives. By obtaining such a perspective, which is tantamount to estimating the range of feasible outcomes, the MNC negotiators may avoid making unrealistic demands, speed up the negotiations, and increase the mutual credibility of the two sides. Formal estimation of the host country's minimum position is, however, relatively rare at present.

The emergence of negotiations as a major function for international operations has placed additional strain on the planning process. The shorter term components of corporate plans should, and increasingly do, include plans for negotiations, and sometimes expected outcomes. In addition, planning (over a long term) for a negotiating staff and its organizational structure is required. This need is rapidly being recognized by MNCs.

CONCLUSION

The changing context of international business has thus changed the nature of the demands for corporate planning in MNCs. The need for systematic economic intelligence and forecasts for use in corporate plans has grown. As the sophistication

and variety of forecasting methods and the complexity of the environment being forecast have all increased, a formal, institutionalized planning process, with its own personnel but within the line organization, has become almost essential. MNCs have, perhaps, moved farthest and fastest in this process, in partial response to their more complex operating environment.

21 General Electric's Evolving Management System

C. H. Springer

The General Electric Company (GE) is one of the most complex companies in the world, and it is apparent that the job of managing General Electric will become still more complex. To meet the needs of the 1970s and beyond, the necessary evolutionary steps in the company's management system have been taken, but before discussing the new management system, a brief review of the recent past may be useful.

HISTORICAL PERSPECTIVE

In the 1920s and 1930s, when the company was smaller than most of the groups that now make it up, it was managed in a highly centralized way. As just one example, as late as 1948, the centralization was so great that any proposed pay increase that raised a salary to more than $6,000 annually had to be sent to New York for the personal signature of the chief executive.

The growth of GE during World War II forced the development of a new management system. For better management control and for continued growth, the company had to identify the businesses it was in and then organize those businesses in a manner that would give them maximum opportunity to grow and prosper. To accomplish this, the company decentralized in the early 1950s.

Under decentralization, the department became the organizational building block. It was a business. It had specific range of products. It had its own marketing, engineering, manufacturing, finance, and employee relations functions. Theoretically, it was virtually self-contained. Except for a few reservations of authority necessary to the overall corporate interest, it was to operate on the theory that its management had authority to make all the necessary business decisions. By the same token, its management was accountable for the business results and was to be rewarded accordingly.

Concurrently, a number of "services" were established at the corporate level. Most were essentially a mirror image of the functions specified for a department: marketing services, engineering services, manufacturing services, and so forth, with research, teaching, consulting, and "right-to-look" responsibilities. In a very real sense, those corporate-level service organizations were designed to provide a competitive edge to each of the company's businesses, by giving them access to expert knowledge not available to a department's independent competitors outside General Electric.

This management system was a revolutionary concept for GE at the time. Putting it in place required a lot of teaching, and it took time to accomplish. But it encouraged aggressive department management teams motivated by a results-oriented incentive system to pursue a multitude of business opportunities.

With increasing growth and diversification, the dogmas of the quiet past once more proved inadequate for the stormy present. By the mid-1960s GE had put into place another company equivalent to the size that Westinghouse, its next largest general competitor, is today. Along with this growth, diversification substantially increased, extending well beyond the traditional activities of power generation, transmission, distribution, and consumption. With both growth and diversification came an attendant need to speed up the decision-making process. At the same time, the magnitude of risks grew as the departments became larger and the overall environment changed.

Consumerism, minority employment, and the physical environment all demanded attention. As top executives became more involved in these issues, the combination of "inside" management problems and "outside" social problems placed extreme time pressures on them. Thus, in 1968, to help share the load at the top, a five-man president's office was established.

At the same time, to further reduce the growing management load on general managers at the group, division, and department level, the five groups then existing were reorganized into ten; the 29 divisions, into 50; and the 110 departments, into 170. The whole thrust was to put in place components of limited size and complexity that a manager could control. In the process, however, some businesses were fragmented among the new departments, and planning for these multidepartment businesses became increasingly difficult. In many cases, the original concept of the department as the profit center and the business was lost. A business identification problem emerged, very similar to the one faced in the late 1940s.

As the company's growth continued, management problems were exacerbated. There was a clear recognition that the system needed to be changed again. Forward planning, in particular, at both the corporate and operating unit levels, needed to be approached in a more fundamental and more disciplined way.

There were two problems. First, the corporate executive office would now require more staff work to help them in steering this very complex and diversified company in the direction in which it should go. This would be a different kind of staff from the functional services staff that had been put in place in the 1950s. In

the functional services concept, there had been no specific provision for a corporate staff to do strategic planning at the corporate level. Nor was there ability to address "business" problems among fragmented businesses, other than on a task-force or study-team basis. The second problem was to improve business planning in the operating components. There was a need to improve its effectiveness and its integration with overall corporate plans, to ensure better allocation of company resources.

To provide more effective staff work for the corporate executive office, a basic separation was made between ongoing day-to-day staff work needed to keep the company running and longer range corporate-level staff work necessary to ensure the company's future position. Ongoing staff work has been assigned to a new corporate administrative staff, and longer-range corporate-level staff work, to a newly created corporate executive staff.

The basic structure of groups, divisions and departments is being retained for management control system purposes. For planning purposes, though, a strategic planning system is being superimposed on this structure, calling for certain components to be grouped as *strategic business units* (SBUs).

THE STRATEGIC BUSINESS UNIT CONCEPT

A strategic business unit is an area of business (or collection of related businesses) specifically designated by the corporate executive office, where, in the judgment of that office, enough of the following requirements are fulfilled to assign total business accountability, both short and long range, to one manager.

The component must have a unique business mission independent of the mission of any other component.

The component must have a clearly identified set of competitors.

The component must be a full-fledged competitor in the external market (as contrasted with a dominant role as an internal supplier to other parts of GE).

The component must have the ability to accomplish integrated strategic planning with respect to products, markets, facilities, and organization relatively independently of other SBUs.

The component manager must be able to "call the shots" (within approved plans) in the areas crucial to the success of that particular business, including, at least, technology, manufacturing, marketing, and cash management.

The intent of these requirements is to designate strategic business units that can be operated as much as possible as if they were independent businesses.

Ultimately, however, there is really only one business unit – the company as a whole. The manager of an SBU must at all times be prepared to subordinate his decision authority to a higher level on matters involving overall company interests. Such overall interests would include, but not be limited to, major external pur-

chases, matters involving the U.S. or foreign governments, investment interests in foreign companies, and the overall reputation of the company.

Dividing the company into SBUs required considerable analysis. Alternatives were formulated for each group, evaluated by the group executive, and finally approved by the corporate executive office. The designation of a component as a strategic business unit is subject to a regular review to ensure that it still meets the criteria, and it is expected that changes in SBU designations will be made frequently as the company grows and develops.

Important to the new system are new flexibility in the classification of components and in the nomenclature used to name them. Any component classified as an SBU has the word "business" added to its name: an SBU can be a business department, a business division, or a business group. Each level of strategic business unit can be organized in a variety of ways. A business division, for example, can be made up of product departments, program departments, or project departments – all of which have profit-and-loss responsibility. Or it can be made up of functional departments – marketing, engineering, manufacturing. The structure adopted for an SBU is based on what is best for that SBU and for the implementation of its strategy.

THE PLANNING FUNCTIONS

Why all the concern about defining and classifying different types of departments, divisions, and groups? Because, while all continue to be headed by general managers, the *planning* job of the general manager is not the same in each department, division, or group.

Very simply, the concern is to make planning a more orderly and clearly specified process than it has been. If a component of GE becomes an SBU, it performs a strategic planning function. If a component becomes a part of an SBU, it performs an operational planning function. If a component includes more than one SBU, it performs a strategy review function.

Basic responsibility for strategic planning rests ultimately with the general manager of the SBU. While he may have staff in place to help him do the job, he is held fully accountable for the quality and viability of the strategy alternates, strategic plans, and operating plans of the SBU.

While the *responsibility* for seeing that strategic planning is done resides at the SBU level, the *work* of strategic planning also involves operational people at all levels below the SBU. The final SBU strategic plan is the result of joint inputs and joint efforts by all planning levels, with final responsibility for its content resting with the SBU general manager.

Strategic planning covers these elements:

1. Formulation of assumptions about the environment and competitors
2. Identification of opportunities and threats in the external environment

3. Analysis of the SBU's strengths and limitations relative to its competitors
4. Preparation of the SBU strategic plan in response to the analysis
5. Preparation of the SBU operating plan, which details the next year's operations under the SBU strategic plan

Operational planning, done by components within an SBU, answers the question of what specifically the component is going to do to support the overall SBU strategic plan. Operational planning affects strategic planning the way a burr under the saddle affects a horse – constantly irritating to stir new thought concerning the choice of strategies. People doing operational planning and those doing strategic planning have to work together as a team continuously.

Strategy review, done at organizational echelons above the SBU, examines all SBU strategy alternates, SBU strategic plans, and SBU operating plans in order to

Check the soundness of proposed objectives and strategies
Propose alternatives for consideration
Review resource allocations for consistency with agreed-upon strategies

It should now be apparent why the classification of a department, division, or group is very important. It spells out what kind of planning is to be done in that component, and the role of the component and its management in the new management system.

THE PORTFOLIO MANAGEMENT CONCEPT

The strategic business unit has been defined as a portion of the company judged and designated by the corporate executive office as warranting the delegation of total business accountability, short- and long-range, to one manager. The significance of the SBU is revealed further through its role in the process by which the corporate executive office develops a mission, objectives, goals, and strategy for the General Electric Company as a whole.

In the past, the corporate office allocated scarce resources across 170 or more departments within the company. With the advent of strategic business units, the corporate executive office now focuses on allocating resources to only about 40 clearly identified businesses – the SBUs.

In General Electric, as in any diversified company, there is a *portfolio* of businesses represented by SBUs, each with different characteristics. The corporate executive office is faced with the question of how to assign the resources of the company in order to maximize overall effectiveness of the businesses in the portfolio. The office is also faced with questions of adding new businesses to the portfolio and of eliminating others.

The idea of portfolio management can be illustrated using cash as the resource to be managed. A diversified company should strive for a desirable balance in its portfolio:

Cash generators – secure, mature businesses that generate the cash that can be invested in the high-growth businesses

Growth businesses that can potentially be moved into leadership positions with the infusion of cash

Developing businesses that hold great promise of becoming highly profitable cash generators as their markets mature

Each of the company's many businesses should fall into one of these categories. A business that will not eventually generate cash is a liability and a candidate for elimination from the portfolio.

To allocate resources among the company's portfolio of businesses requires more than a series of piecemeal judgments, one business at a time. A sound portfolio analysis takes account of interaction between businesses.

The first step is to get good plans from each business. Although the strategic planning system varies from business to business, a typical plan will include nine logical elements:

1. *Data-base information* about the external environment, in such categories as society, market, customers, industry, suppliers, and government
2. *Environmental analysis*, a process for evolving key assumptions about the future environment in which the business will operate
3. *Competitor analysis*, a process for evolving key assumptions about competitors and about the strategy each is likely to follow
4. *Resource analysis*, a process for assessing the strengths and limitations of the business, relative to its competitors, in such terms as ability to conceive and design, ability to produce, ability to market, and ability to finance
5. *Opportunity and threat analysis*, a process for developing a statement about the combinations of time, place, and circumstance in the future external environment that could have potentially favorable or unfavorable impacts on the business
6. *Stakeholder analysis*, a process for assisting in the development of a business's objectives by assessing the expectations and needs of all parties who have a stake in what business does
7. *Strategy development*, a process for synthesizing a possible deployment of the business's future resources, in light of its stengths and limitations, to take advantage of identified opportunities while countering threats
8. *"What-if" analysis*, a process for developing contingency plans for the business, which state in advance how the strategy or the objectives will be modified if key environmental or competitor assumptions turn out to be false
9. *Performance analysis*, a process for "costing-out" a strategic plan, thus

expressing planned results in terms of the usual measures of business input, output, and performance

A second requirement for allocating corporate resources well is the availability from selected strategic business units of *viable strategy alternatives*. A strategy alternative is a first cut at one or more optional strategic plans for the business, a plan that has been thought through to its major probable consequences, but not worked out in detail.

If an SBU were an independent company, of course, it would also develop strategy alternatives; it would then try to choose the "best" strategy for itself, in terms of its own chosen objectives, and then follow it. However, in a large company made up of many SBUs, what is best for each SBU may not, in sum, be what is best for the company as whole. Strategy alternatives must be developed for at least some of the SBUs, to allow more flexibility in seeking a combination that will optimize company performance.

For a strategy alternative to be viable, it must be one with which the business can live, should it be the one eventually agreed upon. The alternative must define a feasible and believable course of action that the business can take to achieve its objectives. The alternate plan for the business may:

Define for the business a substantially different set of long-term objectives from those of the other strategy alternatives developed, insofar as these objectives have direct bearing on factors of concern to the company as a whole – e.g., societal needs, resource requirements, profitability, and degree of risk

Show how to achieve the same set of long-term objectives as another strategy with substantially different profiles for such factors as cash flow, profitability, or risk in the short or long range

A viable strategy alternative must either indicate means for achieving a different set of ends, or different means for achieving the same ends, in either case with different intermediate consequences for the company.

Developing strategy alternatives is a difficult undertaking, not only in handling the volume and complexity of the work required, but also in overcoming the psychological inhibitions of managers accustomed to thinking only in terms of "best" (that is, suboptimized) strategies. Fortunately, in any one year perhaps only a fourth of the SBUs need to develop alternatives for consideration at the corporate level.

The third requirement for effective strategic management is a disciplined approach at the corporate level, where all the SBU strategic plans come together into a corporate strategy. Thus GE has installed a corporate strategic planning process, a carefully structured system for interrelating the development of the corporate strategy, consideration of strategy alternatives, evaluation of strategic plans for the SBUs, development of planning guidelines for each business to set the pattern

for its next planning cycle, and, finally, annual budgets for each business. This process is discussed below.

IMPACT ON MANAGEMENT CONTROL SYSTEM

How have changes in strategic planning affected management control? Management control ensures that strategic objectives are accomplished effectively and efficiently. It is effective only if

It communicates expectations and results clearly.
It motivates all business managers to do their best to accomplish corporate objectives.
It provides a useful diagnostic tool to help business managers and corporate management judge the continuing appropriateness of strategies now in effect.
It is integrated with the strategic planning system.

At General Electric the existing organizational structure was retained for management control purposes, and the strategic planning system was superimposed on it. Two basic principles were applied to fit the two together:

The management control system must ensure that resource allocation decisions made as a result of strategic planning are tracked and measured for the attainment of the stated objectives.
The performance appraisal and motivational aspect of the management control system must be properly designed to reflect the longer-term strategic point of view.

To ensure that the management control system does perform in accordance with these principles, certain modifications were needed. Modifications are least disruptive if they can be made gradually; however, some modifications required immediate attention. These included:

- Restructuring measurements used in the management control system to avoid the fallacy of relying on a single criterion. No single measure can encompass the total short- and long-run contribution of a business. The evaluation or measurement system plays so great a part in influencing management performance that it must employ a number of criteria. Some of these may be subjective. General Electric recognized the need to evaluate more than a single aspect of business performance almost 20 years ago, and eight "key result areas" were established, and component and corporate performance were measured against these. The introduction of formalized strategic planning has reinforced the need for this approach to performance evaluation and has forced a search for improvements in techniques.
- Modifying the control system to allow different performance measures for different strategies. With the diversity between the various strategic business units,

ways were sought to encourage each SBU to focus on those goals and time dimensions that are critical to its environment. Each SBU must have a hand in tailoring some of the variables that apply to its business. Hopefully, this also leads to performance measures that are relatively simple to understand, without undermining the need for measures that allow overall assessments of corporate performances.

- Supplementing traditional accounting and financial figures in order to increase the perception of problems limiting achievement of strategic objectives. The system is being modified so that it will allow corporate and SBU problem solving to function together. This is probably the most significant modification of earlier management control systems, which were based primarily on financial accounting measures.
- Revising measures and rewards to ensure specific incentives for taking a long-term point of view of planning and resource allocation. Getting way from emphasis on this year's results requires specific actions, not just lip service.

General Electric's strategic planning system is integrated with and supported by a management control system that provides the mechanisms for implementing, measuring, and adjusting the operating plans developed through strategic planning.

THE CORPORATE MANAGEMENT STRUCTURE

A new form of corporate-level organization of General Electric is an integral feature of the company's new management system. Reporting to the board of directors is the corporate executive office, comprised of the chairman of the board, the chief executive officer and the several vice chairmen and executive officers. The main functions of the corporate executive office are to set overall company objectives, to shape strategic directions for achieving these objectives, to develop the company's basic management structure, to monitor short-term operations, to decide on deployment of key managers, to make recommendations to the board of directors, to maintain critical external relationships, and to provide total company leadership.

In its responsibility for determining the future direction of the company, the corporate executive office now has the support of the new corporate executive staff, comprised of several senior vice presidents, selected in some cases for their experience as group executives, in others for their experience with broad corporate problems. They are business generalists, who help the corporate executive office improve the decision-making process on matters of strategic importance to the company.

The corporate executive staff is responsible for

Appraising trends in the overall environment in which the company operates

Reviewing and evaluating plans developed by the operating components to see how they fit overall corporate strategy and to help the corporate executive office make resource allocations

Recommending courses of action on critical issues of strategic importance to the company as a whole

The corporate executive staff also has responsibility for leading small groups with expertise in a number of critical areas – human, financial, production, and technical resources, and the economic, social, and political environments. Corporate staff, then, blends general skills with knowledgeable specialist support.

A corporate administrative staff has been established. It does work that must be done at the corporate level because the company is a single organizational and legal entity, and work that should be done at the corporate level for reasons of economy or uniformity. The corporate administrative staff is headed by a senior vice president.

To provide a forum for discussion of matters of broad corporate concern, a corporate policy committee meets once or twice a month. This committee includes members of the corporate executive office, the senior vice presidents of the corporate executive staff, and the head of the corporate administrative staff.

There is one additional component, and an important one, at the corporate level. It is corporate research and development, responsible for the generation of new technology beyond the scope of operating groups. This component, headed by a vice president, manages laboratories and appropriate administrative support functions.

In summary, the corporate organization comprises

The corporate executive office, for overall direction of the company

The corporate executive staff, to give guidance on the future of the company

The corporate administrative staff, to carry out ongoing corporate-level work

The corporate policy committee, to provide a forum for discussion by the top executives of matters of broad corporate concern

Corporate research and development, to give the company a leading edge in technology

To help coordinate work being done at the corporate level and at the operating level, an executive board has been established for each of the company's groups. The chairman of each board is the member of the corporate executive office with executive officer responsibility for that particular group. Serving with him are one other executive officer, the senior vice presidents from the corporate executive staff, and the group executive for the group. Two essential jobs of the executive board are to provide guidelines for the planning done at the strategic business unit level, and to provide evaluation and review of the strategy alternates, strategic plans, and operating plans prepared by the strategic business units. This is done on a carefully systematized basis – the corporate strategic planning process.

THE CORPORATE STRATEGIC PLANNING PROCESS

The corporate strategic planning process is a formalized statement of the process by which the corporate strategy and the SBU strategies are integrated in order to move the company in the direction it wants to go, taking into consideration the alternative courses of action available to the SBUs. The SBUs obtain input from the corporate level in order to do their strategic planning, and the output of all SBUs is evaluated at the corporate level to see that this output conforms with the broad corporate strategy and will move the company toward its objectives and goals.

This process has been designed to have several important characteristics:

To be disciplined, with specific, planned inputs and outputs required at each stage of the process, with activities scheduled according to an orderly procedure, and with an orderly program of feedback

To provide for an annual cycle, giving all levels the chance to "plan their planning" on a yearly basis

To include standards for documentation, so that there can be uniformity in the quality and coverage of written material required by the process

To facilitate integration into the process of all elements – internal and external – affecting the company and its businesses.

The corporate strategic planning process is most easily understood as a four-phase process, each phase marked by clearly defined interaction between top management and the SBUs:

1. To develop an explicit statement of corporate strategy
2. To develop the SBUs' strategy alternatives, which must be responsive to the requirements of the corporate strategy
3. To generate and review strategic plans for each SBU based on the agreed-on strategy alternatives
4. To derive from the strategic plan operating plans for the next year

These four phases, taken together, constitute an annual planning cycle for the company. At the start of the cycle, the corporate executive staff prepares long-range environmental forecasts for review by the corporate executive office. These forecasts are also made available to the SBUs as input to their planning. Then, at a scheduled meeting, the corporate executive office reconsiders the company mission, objectives, goals, and strategy. From this comes an explicit statement of the corporate strategy, which sets the stage for strategic planning in the SBUs. The implications of the corporate strategy for each SBU are then communicated to the SBU in the form of preliminary planning guidelines, which will, in some cases, include the nomination of strategy alternatives that need to be developed by particular SBUs.

Next, strategy alternatives are developed by the SBUs. These strategy alternatives, along with the group executive's recommendations, are presented to each group's executive board for review. After this review, the executive board nominates a recommended strategy alternative for each SBU, along with one or more other strategy alternatives, for consideration at the following corporate executive office session. At this session, all the strategy alternatives nominated for consideration by all executive boards are reviewed, to balance the corporate portfolio.

The new management system has two advantages here. First, the 40 strategic business units (compared to the former 170 departments) produce a more manageable set of strategy alternatives for the corporate executive office to consider. Second, the planning cycle makes all strategy alternatives available to the office at the same time. The result is a wide latitude of choice, reducing the risks associated with making decisions about one business at a time.

Next, based on current and forecast levels of available corporate resources, tradeoffs and resource allocation decisions are made, and final planning guidelines are transmitted to each SBU, specifying the strategy alternative that the SBU is to use as the basis for its strategic plan. These final SBU planning guidelines also include the long-term earnings targets and other information that is essential to the SBU in its strategic planning.

Phase three of the corporate process begins with SBU strategic plans being submitted for review at scheduled sessions of the executive boards. Preliminary operating plans and preliminary budgets for the ensuing year are also submitted at this time. After all SBU strategic plans have been presented, a summary corporate executive office session will lead to final short-range guidelines, on which each SBU will base its operating plan and budget for the next year.

Phase four calls for the presentation of SBU operating plans and budgets to the group's executive board, where they are reviewed, possibly revised, and finally approved.

This four-phase approach provides for interchange of information at the cost of being complicated. To judge whether the benefit of such a process exceeds its costs, consideration must be given to the many ways the process can strengthen planning at all levels of the company. It provides

- An explicit statement of corporate strategy as the cohesive force to move the company in the direction it wants to go
- In-depth analysis, at the corporate level, of environmental factors that affect the future of the company, and translates this into long-range environmental forecasts that are made available to the SBUs as a base point for their own environmental analyses and planning
- The generation and evaluation of strategy alternatives
- Mechanisms for balancing the corporate portfolio of businesses so that each SBU plays a strong role in moving the company toward its overall objectives
- Planning guidelines to ensure that SBUs are aware of management expectations and of their role in the corporate portfolio

- Links between long- and short-range decisions by ensuring that the operating plan is actually a detailed version of the first year of the strategic plan, and that operating plan experience feeds back to future strategic planning
- Explicit definition of the planning job of each general manager – so that there is no confusion about where strategic planning will be done, where operational planning will be done, and where strategy review will be done

22 Strategic Planning in the Amstar Corporation

Howard B. Wentz, Jr.

Although the Amstar Corporation is not as large and diversified as General Electric (Chapter 21) or as involved with changing technology as IBM (Chapter 23), it also places great emphasis on strategic planning. Amstar does face some unusual issues of price fluctuations, both for the raw materials it uses and for its finished products. Concepts and methods of strategic planning employed by Amstar are in many aspects typical of those used by much of American industry.

THE PLANNING ENVIRONMENT

Amstar is the largest producer of sweetener products in the United States. Its annual sales volume is over $1.5 billion dollars, mostly domestic sales within the United States, and it employs approximately 6,800 persons and maintains manufacturing and distribution facilities and offices in 22 states. It is the largest cane sugar refiner, with five major refineries in the East. It is the second largest beet sugar producer, with five large factories in the West. In Amstar's last fiscal year it sold over 6.3 billion pounds of sugar, representing over 25 percent of the U.S. consumption.

In general, Amstar is not directly involved with agriculture. It buys its raw cane sugar from domestic and foreign sources and contracts for its sugar beets from independent domestic growers. Recently, Amstar entered the corn-based sweetener business and is growing rapidly in that field. Amstar's sweetener businesses are heavily capital-intensive enterprises.

The corporation also manufactures and sells nonsweetener products, including packaged portion-controlled condiments, mechanical equipment and components for industry, and specialty paper and packaging products. The manufacture and sale of these products are part of a continuing program of planned diversification that began in 1968.

In developing strategic plans for Amstar, consideration must be given to a diversity of markets, products, and raw material supplies. To illustrate, a few of the important factors affecting the business are

Raw cane sugar prices, production, and consumption worldwide

Domestic per capita consumption of nutritive sweeteners, including corn, beet, cane, and substitute sweeteners in both industrial foods and grocery sugar products

The general agricultural commodity outlook as it affects production and pricing of sugar beets and corn

Availability and price of energy supplies

Trends in the use of paper and disposable packaging

Availability and price of wood pulp and paper

Level of total U.S. capital goods spending, industrial activity, and commercial construction

This is not an exhaustive list, but it is suggestive of the variety of considerations that affect strategic planning for the corporation.

CONCEPT OF THE PLANNING PROCESS

The strategic planning process at Amstar is an *annual activity* to help management operate the businesses effectively and to improve results. The process focuses attention on important issues related to the continued profitable operation of the business and a set of disciplines and information that aid management in determining direction for the company; providing long-term strategies and goals as a frame of reference for short-term decision making; directing management effort, creative and technical skills, and capital toward achievement of agreed-upon end results; and providing a means of measuring performance.

The process is directed toward preparation of annual strategic 5-year plans that focus on profits, are market-oriented, are prepared by operating management, and are fundamentally action-oriented, flexible and achievable.

Strategic planning starts with a set of basic corporate objectives set by the corporation president and senior officers. These objectives are specific, quantitative targets for return on investment and annual growth in profits. Targets are based on the financial characteristics of the corporation and on management's realistic assessment of attainable performance.

To facilitate effective planning, the corporation is divided into business units, or identifiable portions of the corporation that can be managed as integral business entities or profit centers. Within Amstar there are seven individual business units that prepare annual strategic plans relating to the future of that unit in its relatively independent markets and competitive environment.

The annual strategic planning process begins with the corporation president

informing each responsible business unit manager in writing of his expectations, or objectives, for that unit. These business unit objectives reflect and are derived from the overall corporate objectives, historical performance, and assessment of future opportunities. The objectives are stated in quantitative terms and embrace a target return on invested capital, and a target annual growth rate in earnings. In addition, the president specifies a charter for the business unit, which designates the business areas assigned to the unit. The charter specifies business areas for which the business unit manager is responsible in developing his strategic plans. It may include the opportunity to diversify into related businesses through acquisition or internal development.

After receiving the document, the unit manager has 3 months to prepare and submit to the president a strategic plan for his unit. The plans are prepared in substantial detail and are submitted in a standard form; they include, for the 5-year planning span,

- The business outlook for the unit, reflecting market and product growth opportunities, competitive matters, and other factors influencing the unit's future
- The identification and discussion of proposed strategies
- A listing of programs, activities, and organization required to implement the strategies
- Detailed financial projections for 5 years, including income statements, capital expenditure requirements, balance sheets, cash flow statements, research and development costs, personnel requirements, and key financial ratios

The unit plans are submitted to the corporate planning staff, which carefully reviews each plan with the unit managers for consistency and completeness. The proposed strategies, activity listings, and financial projections are reviewed in depth. Using the results of this staff reveiw and other data, the president then reviews and discusses the plans with the unit manager and his staff. If necessary, the plans are revised, reworked, or altered until final approval for the plan is given by the president to the unit manager.

When all of the unit plans have been completed and approved, the corporate planning staff consolidates the seven units' financial plans for the president. The consolidated plans are then reviewed by the president and senior officers of the corporation. Careful review and discussion of the plans by corporate management provides the basic data and framework for planning corporate capital, human and technical resource allocations.

UNCERTAINTIES AND RISKS

Formulating strategic plans requires careful assessment and recognition of the uncertainties, risks, and unknowns affecting the effort. The most obvious are

uncertainties related to product demand, pricing strategy, competitive situations, and market share position for each business unit. Each of Amstar's units operates under different influences. These influences for each unit are best understood by the unit managers from their experience and from data they receive from many sources. To take uncertainties into account, units evaluate a variety of volume forecasts, each made under different pricing and competitive assumptions. The purpose of this approach is to examine a range of possible alternative strategies and actions, given varying market and competitive conditions and responses.

Closely related to market uncertainties are general economic uncertainties. To ensure some uniformity in the economic outlook, the corporate planning staff provides basic economic data for the 5-year planning period to all units on projected growth of real gross national product, projected general inflation rates, selected price escalations for various commodities and products, and indicators of projected business activity, among other things.

These basic economic data are collected from sources within and outside the corporation. External sources include government reports, private sector economic forecasts and selected industry trade association information. Careful consideration of data is necessary to make plans properly reflect the impact of various external economic factors. Data also provide background for judging the reasonableness of individual plans.

A third kind of uncertainty to be considered in our planning results from potential state and federal governmental actions or legislation that may significantly affect the future of the corporation. Administrative and legislative action and court decisions can cover agricultural policy, taxation, environmental or pollution controls, consumer protection, and many other areas. Basic assumptions about governmental impact are usually provided to the unit manager by the president. Although these assumptions are ultimately the responsibility of the individual unit manager to interpret, they must be reflected in his plan.

ORGANIZATIONAL CONSIDERATIONS IN PLANNING

Strategic planning as conceived and used within Amstar is simply a disciplined annual process to review, under current economic, competitive, and market conditions, the fundamental outlook and future direction of the corporation. The plan sets a basic direction for corporate activities and efforts. From the basic direction and strategies, at both corporate and business unit levels, the plans provide a framework within which to allocate human, financial, and technical resources. Resource allocation is directed toward exploiting opportunities to optimize profits.

The strategic planning process provides an annual review of company prospects. It is important to recognize that some strategies may change from year to year to reflect current market, competitive, and economic conditions.

The planning process is organized with an emphasis on achieving flexibility in

developing the plans. The president and senior officers set specific corporate and business unit objectives. However, within these specific objectives and business charters, unit managers are given considerable latitude in the formulation of their strategic plans in deciding how to achieve the objectives. The unit managers formulate the plans. The corporate planning staff serves primarily as a critic of the plans for the president and senior officers, providing evaluations of their reasonableness, completeness, and realism.

The strategic plans developed by the unit managers, it is important to emphasize, are their plans. The corporate planning group in its review function is not the final arbiter of the unit manager's strategies and action plans. Final agreement on all plans is reached between the president and the unit manager. Since the unit manager is responsible for both the strategic planning for his unit and for daily operations, he must balance his efforts among strategic planning, operational planning, and day-to-day control. The planning process is designed to help achieve and maintain this balance.

Overall financial resource allocations for the corporation are resolved by the president. These allocations are based on objectives, opportunities, and return on investment reflected in the corporate and business unit strategies. They must also be made to counter the threat from risks and uncertainties that exist. The planning process allows the corporation to weigh opportunities and strategies against uncertainty and risk.

23 Overview of Planning in the IBM Corporation

Abraham Katz

The IBM Corporation develops, manufactures, markets, and services a wide variety of information-handling products, but its activities are largely concentrated in three business areas:

Data processing (DP): larger scale data-processing systems, such as the System 370

General systems (GS): smaller scale data-processing systems, such as the System 3, as well as sensor-based systems, such as the System 7

Office products (OP): typewriters, copiers, and a variety of other products used in the office

Other IBM activities deal with advanced technology and special systems to meet the need of the United States Government; with disk packs, data modules, and supplies used in information-handling systems; and with textbooks, educational kits, learning systems, guidance products, and a wide range of testing materials and services for schools and industry.

The uses of IBM products, systems, and services cover the entire spectrum of human activity, from science, business, and health, to education, the arts, and entertainment. Geographically, they may be found almost everywhere, from urban centers to rural areas. The uses of information-handling products continue to expand rapidly, being limited only by the creativity of their users.

The scale of IBM operations throughout the world is reflected in the following data for 1974:

Gross income from sales, rentals, and services	$12.7 billion
Total assets	$14.0 billion
Number of employees	292 thousand

IBM does about half of its business outside the United States. The structure of the organization is illustrated in Figure 23.1.

ORGANIZATIONAL PHILOSOPHY AND STRUCTURE

IBM operates under a philosophy of decentralized operating management. IBM activities have been grouped into a number of operating units differentiated by business area or geographic region, that, where feasible, have been given profit/loss responsibility. To support their relative autonomy, they have been entrusted with the range of functions (development, manufacturing, marketing, and service) needed to conduct their business.

Control of business policies is centralized at the corporate level; IBM corporate policies provide the broad framework within which all operating units function, and within this framework, the management of an operating unit is responsible for development and implementation of its plan.

Before implementation, the plans (and changes in plans) are reviewed and approved by the corporate management. Performance against plan is measured and controlled primarily by operating unit management, but it is also monitored by the corporate staff. Periodically, the results of operations are reviewed with corporate management, assisted by the corporate staff.

Insofar as IBM's three primary business areas are concerned, corporate management has assigned the following missions to the five operating units involved:

Data Processing Complex (DPC): For the large systems data-processing business area, DPC has worldwide responsibility for developing products and coordinating market requirements. It has responsibility within the United States for manufacture, marketing, and service of large systems. For selected products, DPC serves as the worldwide source of supply.

General Systems Division (GSD): For small or sensor-based systems, GSD has responsibilities worldwide and within the United States that are analogous to those that DPC has for large systems.

Office Products Division (OPD): For office products such as typewriters and copiers, OPD has responsibilities worldwide and within the United States that are analogous to those of the DPC and GSD.

Europe/Middle East/Africa (E/ME/A): For all three of the major business areas, E/ME/A has responsibility within its geographic region for manufacture of most of its products and for marketing and service of all three product lines. It may provide engineering or programming services to other operating units.

Americas/Far East (A/FE): For the three business areas, A/FE has responsibility within Latin America and the Far East that are analogous to those of E/ME/A.

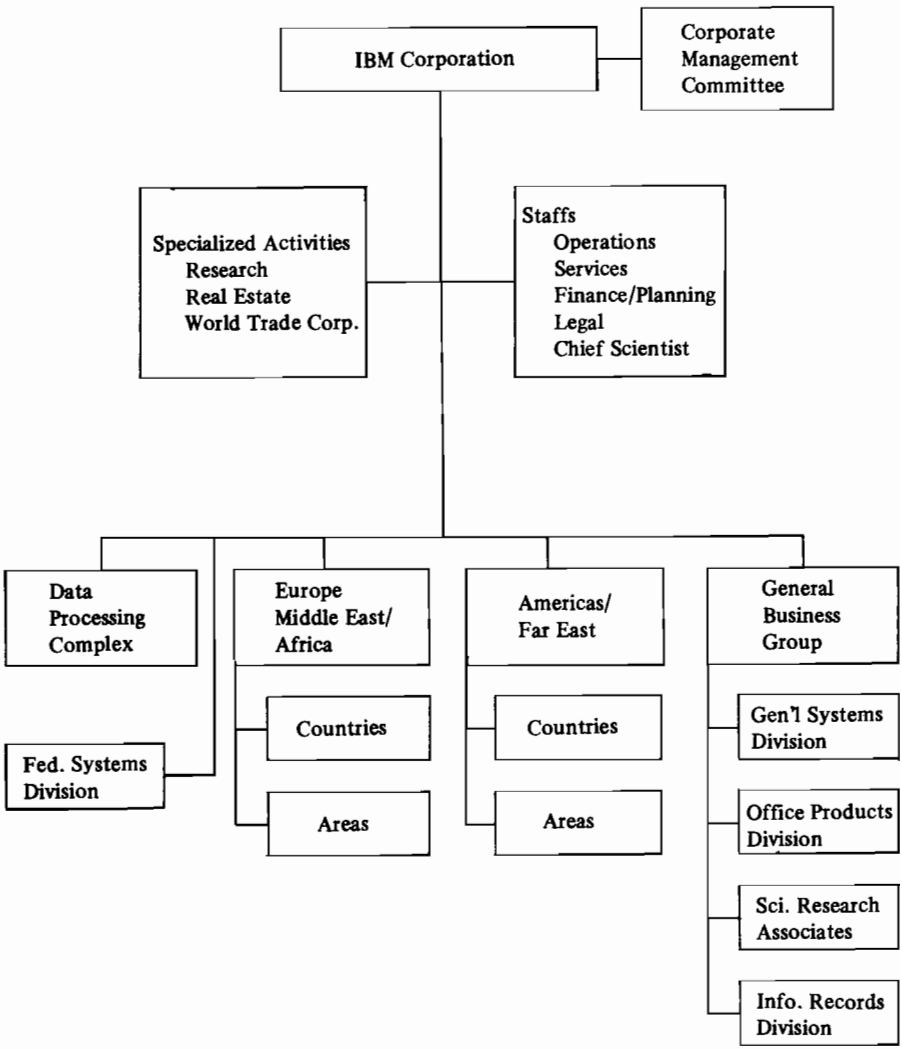


FIGURE 23.1 Organizational structure of IBM.

The result is a "matrix management" system in which corporate management deals with three major business areas in three geographic regions of the world through the five designated operating units. There is strong interdependency among the five units and some degree of overlap among the three business areas. Consistent with the company's philosophy of decentralized operations, the planning and control system permits the five units to develop and implement separate plans within an integrated corporate framework.

THE PLANNING PROCESS

The planning and control system pervades the entire IBM organizational structure. Not only has the bulk of the planning done within IBM been decentralized into the several operating units, but, within any given unit, planning is further decentralized to the plant, laboratory, and local office levels. The system serves as a primary communication link between corporate management and operating unit management for establishing objectives and strategic direction, negotiating plan commitments, and measuring performance against plan.

There are, as shown in Figure 23.2, two distinct but interactive kinds of planning within the system: program planning and period planning. Program planning is planning to develop a product or to enhance the efficiency and vitality of a functional element (e.g., marketing, service). A product program generally has a single-product, market-related objective, but it may involve several functional elements.

The time horizon is determined by the nature of the problem objective and the work processes required to achieve it. The cycle for review and decision making is determined by the inherent dynamics of the program rather than by the calendar. At any point in time, each operating unit normally has a large portfolio of programs that it is planning to carry through.

Period planning complements program planning by looking twice annually at the program portfolio within an operating unit and at the company as a whole. Period plans establish the optimal balance among multiple programs and objectives. The time horizons for period planning are fixed by corporate management: 2 years for the operating plan lying within the 5 years for the strategic plan. The cycle for review and decision making is tied to the calendar to ensure an operating budget for each unit at the beginning of each year.

Clearly, decisions made as part of the period planning process may affect program plans – accelerating some, delaying some, and terminating others. The converse may also be true: some program decisions may require changes in the period plan of an operating unit. Whatever adjustments occur, it is the responsibility of operating unit management to maintain the proper balance among its objectives and resources, subject to review by corporate management.

The challenge of balance can be understood by examining program and period planning in somewhat greater detail. Program planning may be directed toward a system, a product, a market, or some functional objective. To illustrate the process, consider the planning associated with a product program. Such planning generally proceeds in two distinct stages: defining the market requirements and, once the requirements have been accepted by operating unit management, translating them into products. In most cases, the market requirements relate to an existing IBM product, one for which there has been a continuing demand but for which improvements or a replacement is sought.

To sense these needs, the product manager, as part of his normal activities, periodically measures performance versus program plan for the product currently

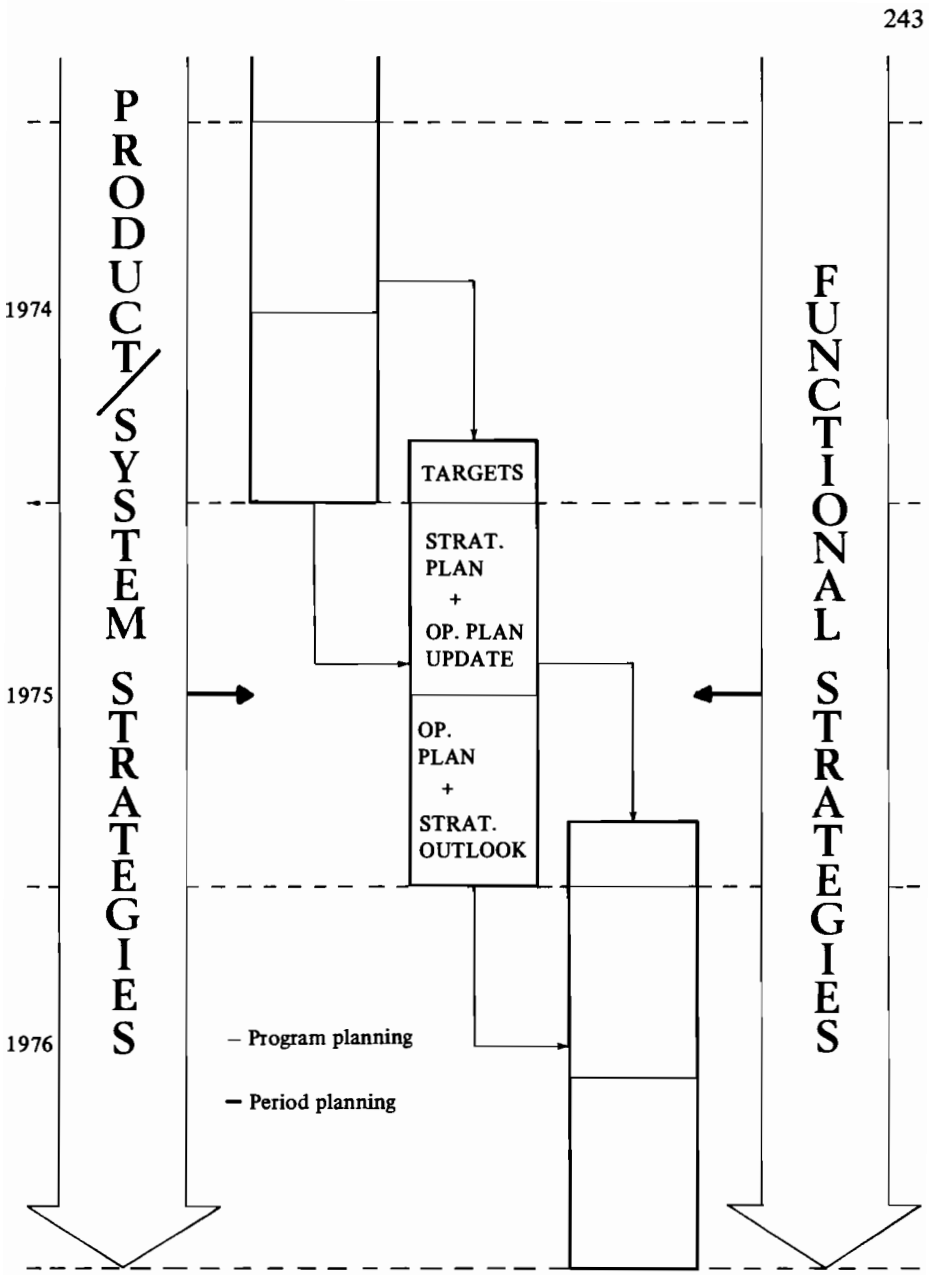


FIGURE 23.2 Period and program planning in IBM.

in the field. At the same time, he proceeds with the exploration and development of advanced techniques and devices. Depending on the product's performance and the availability of new technology, he will recommend to his management ways of enhancing the current product or replacing it with a new product. Since all products must work together within a data processing system, the product manager's recommendations must always be considered within the total systems framework. Systems integrity must be maintained.

In some cases, a customer's needs or desires may be basically new, lying somewhat beyond IBM's current skills and experience. Product planners then work with the marketing force on case studies to determine the functional characteristics of the proposed new product and its expected mode of use by the customer. Depending on the prospects for securing an economically sound product, the product manager will make his recommendations about proceeding with the new program.

Within the assigned product missions, approved strategies, and negotiated organization budgets, programs may be initiated at the discretion of operating unit management. Once the program is initiated, the management will periodically review performance against program plan to determine whether and how to continue. These reviews will typically occur as the product program moves from one phase into the next (from study into design, at the point of product announcement, and so on). The product manager will review all aspects of the program (e.g., forecasts of business volumes, cost estimates, technical problems, schedules) with the operating unit management and with all functions and operating units that have an interest in the program. Before product announcement, there must be agreement among all these organizations on the soundness of the program. After announcement, there are periodic reviews on a continuing basis to monitor performance against program plan.

As shown in Figure 23.2, period planning proceeds in three stages. Target and goals are set annually. Corporate management assigns (or extends for an additional year) targets to each operating unit. These targets are expressed in terms of profit and profit margin over a 5-year horizon for years 3 through 7 beyond the current year. They are designed to be challenging but achievable. When it is satisfied with the feasibility of the targets, the operating unit management will develop and assign internal goals (by system, product area, function, or industry as appropriate) for use in the development of its own strategies and plan.

Responding to the targets assigned, the operating groups with development responsibility (i.e., DPC, GSD, and OPD) prepare, maintain, and publish worldwide system and product area strategies. These provide direction and rationale for product assumptions to be used by operating units in developing both operating and strategic plans. Operating units and appropriate corporate staffs review these strategies. All operating units develop functional strategies to support their plans. The results of this work are reviewed by appropriate corporate staffs.

The several complementary strategies developed by an operating unit are normally balanced among each other and consolidated into a unit strategic plan that is

reviewed and approved by the Corporate Management Committee, which consists of the chairman and vice chairman of the board and the senior vice presidents heading the corporate operations and services staffs (see Figure 23.1). Selected strategies, because of their broad and pervasive influence, may be reviewed separately by the Corporate Management Committee.

Both strategic and operating plans are developed. In the spring, a strategic plan with a 5-year time horizon is put together. The primary purpose of this plan is to establish strategic direction for the operating unit in response to assigned corporate targets. Included within the strategic plan is an update of the operating plan.

To support this planning work, the operating units with worldwide development responsibility generate product assumptions. The corporate economics staff provides the economic and environmental assumptions, and the other corporate staffs issue functional guidance as necessary.

Using an approved strategic plan as a basis, in the fall of each year the operating units develop a detailed plan for operation over the next 2 years. The primary purpose of this plan is to secure commitment about near-term objectives and resources. Planning assumptions are re-examined and, as necessary, changed or reissued. Where appropriate, the outer-year consequences (for years 3 through 5) are shown for the major decisions planned for the first two operating years. Dependencies among the various operating units are examined and renegotiated as necessary.

When the operating unit plans are formally submitted (via a document and series of presentations), the corporate staff reviews and assesses them and agrees or disagrees with them. The bases for deciding which position to take include the degree of consistency with approved strategic direction, the balance between objectives and resources, the relationships with plans of other operating units, and the functional excellence of the plan statement.

Some staffs also write short critiques pointing out the strengths, weaknesses, or risks associated with the individual plans. On the basis of these staff inputs and the operating unit presentation, the corporate management approves or disapproves the plans. Once approved, the commitments expressed in the operating plan's first year become the basis for measurement of performance in that year.

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