PROGRAM BUDGETING IN THE
GOVERNMENT OF CANADA

BY

J.R. LEVESQUE, M.A.

A Thesis submitted to Carleton University
in partial fulfillment of the requirements
for the degree of Master of Arts in
Public Administration

School of Public Administration,
Carleton University,
Ottawa, Canada,
April, 1969.

CONTENTS

1 - Preface	
2 - Chapter I : Nature and Theory of Budgeting	page 1
3 - Chapter II : Program Budgeting: Background and Accounting Framework	page 16
4 - Chapter III: Planning and Control	page 26
5 - Chapter IV : The Techniques of Program Budgeting	page 67
6 - Chapter V : Problems of Implementation and a Case Study.	page 105
7 - Chapter VI : Conclusions	page 118
8 - Appendix I : Overview of the Treasury Board	page 124
9 - Appendix II : Department of Indian Affairs and Northern Development Program Breakdown	page 125
10 - Appendix III : A Statistical Program for the Department of Indian Affairs and Northern Development	page 129
11 - Example of forms utilized in the Department of Indian Affairs and Northern Development's Information and Control System	following Appendix III
12 - Bibliography	page 134

LIST OF TABLES AND CHARTS

Tables

Table I	- Standard Objects of Expenditure	page 12
Table II	- Expenditures of Government of Canada	page 29
Table III	- Expenditures by Functions	page 29
Table IV	- Social Measures	page 41
Table V	- Simon's Decision-Making Continuum	page 79
Table VI	- Cost-Benefit Analysis of Alternative Flood Control Projects	page 98-99

Charts

Chart I	- Government Resources and Spending	page 27
Chart II	- Dimensions of a Plan	page 37
Chart III	- Government Planning	page 39
Chart IV	- Departmental Long Term Planning	page 49
Chart V	- Departmental Short Term Planning and Implementing	page 54
Chart VI	- Simple Feedback - A Cybernetic System	page 58
Chart VII	- Feedback Loop of Management Control	page 60
Chart VIII	- Management Audit	page 64
Chart IX	- A Basic System	page 69
Chart X	- A Complete System	page 70
Chart XI	- Detailed Breakdown of the Elements of a System	page 71
Chart XII	- The Cost-Benefit Principle	page 97

PREFACE

This study attempts to analyze the theoretical aspects of program budgeting which is now being implemented throughout the Government of Canada. The focus is on theoretical considerations for two main reasons; firstly, the author's background and interests lie in the field of economics and management science; secondly, and perhaps a more important reason, it is extremely difficult to do an empirical study in this area because data are very scarce and quite difficult to obtain due to the simple fact that Departments are still in the very first stages of implementation. The only relevant experience one can turn to is that of the United States and this in itself is limited. A case study of the Department of Indian Affairs and Northern Development is included but again it must be emphasized that this is not meant to be an exhaustive study but rather a bird's eye view of the framework of a program budgeting system operating within a department. Program budgeting has caused many changes in organization structure and this in itself created many difficulties in our study of the Department.

Much of this project could not have been completed without the help and advice of the following people: Mr. R.A. Bishop, Financial and Management Adviser, Department of Indian Affairs and Northern Development, Mr. M. Zelman of the Treasury Board, the late Professor A. Willms, Professor Bruce Doern and Professor R.O. MacFarlane whose guidance during the drafting of the thesis was most valuable. Any inconsistencies or errors must, of course, remain the responsibility of the author.

CHAPTER I

NATURE AND THEORY OF BUDGETING

Before we turn to an analysis of the present budgetary system in the Government of Canada let us look at the nature and theory of budgeting; the questions one must ask are 1) what is a budget? 2) what are the functions of a budget? and 3) why is the present system^I inadequate from a manager's point of view.

In 1940 V.O. Key lamented what he referred to as "The Lack of a Budgetary Theory"². He called for a theory which would help answer the basic question of budgeting on the expenditure side: "on what basis shall it be decided to allocate X dollars to activity A instead of activity B?" It is fair to say that 28 years later we still do not have a single theory of budgeting which could answer this type of question although the development of new management techniques, such as benefit-cost analysis, can certainly help the manager arrive at a more rational decision than was the case in the past. Indeed, such is the rationale

1 - "Present system" refers here to the pre-"program budgeting" system which is now being phased out although we still have for the time being a dual system with estimates being prepared both on a "standard object" basis and a "program" basis.

2 - V.O. Key, "The Lack of a Budgetary Theory", American Political Science Review, Vol. 34, December, 1940, pp. 137-144.

underlying program budgeting as we shall see later. Although we do not have a single theory of budgeting there are certain desirable functions that a sound budgetary system should fill. A budget has been defined as:

- "1 - A financial plan serving as a pattern for and a control over future operations;
- 2 - hence, any estimate of future costs;
- 3 - a systematic plan for the utilization of manpower, material or other resources."³

There are three functions implicit in this definition; firstly, a budget may serve as a plan, indicating requirements of certain factors (e.g. cash, productive capacity) at some future date which serves the function of providing information for subsequent decisions and possibly guiding them. Secondly, a budget may serve as a tool of control by containing criteria of cost or performance to be compared with actual operational data; this facilitates evaluations and concern for measures of efficiency. Lastly, a budgetary system must provide a relatively clear way of classifying or coding expenditures in such a way that information can be readily available for the use of the manager. This third function is a basic one; it concerns the mechanical aspects of budgets that is, the coding or classifying of expenditures in a meaningful way; it is what could be termed the "bookkeeping" function.

3 - A.C. Stedry, "Budgets: Definition and Scope", in R.T. Golembiewski, editor, Public Budgeting and Finance, Itasca, Illinois, F.E. Peacock Publishers, 1968, p. 6.

Management is more concerned with the budget's role as a tool of planning and control.

The three functions described above are the major functions of any budgetary system. There are several principles of budgeting which flow from the above. We have identified below eleven of these principles.

- 1) The budget must be sponsored by management; this implies ✓
that the organization must regard the budget primarily as a tool of management, not primarily as an accounting or bookkeeping device. This first principle is basic to the program budgeting system and will be re-emphasized throughout this study.
- 2) The budget should be built up by responsibility centres.
- 3) Responsible supervisors should participate in the process of setting budget figures; in this respect involvement leads to a greater sense of achievement. 7
- 4) Responsible supervisors must have a thorough understanding of the budget process; this involves a program of continuous interaction between top, middle, and lower management.
- 5) The time period covered by the budget should be meaningful in terms of the necessity for and the possibility of effective management action.
- 6) The budget should present reasonably attainable and well defined goals. 7

- 7) In a comparison of actual performance with budgeted performance for control purposes attention should be focussed on "significant" exceptions, that is, on figures that are significantly different than those expected. The definition of significant will of course depend upon management's stated policy.
- 8) The budgetary system should not cost more to operate than its worth to the organization. Sampling in auditing, for example, permits effective control without being as costly as 100% auditing of every transaction.
- 9) The staff and line functions in budgeting must not be confused; line management makes the decision while staff advises the line organization.
- 10) The review of budget estimates by higher levels of management should be thorough; this implies that goals or objectives should also be reviewed and modified or even abandoned if the evidence so warrants it.
- 11) Final approval of the budget should be specific and this approval should be communicated to the organization; an attempt to operate on the principle that "silence gives consent" will ultimately lead to misunderstanding. This principle implies that, as was pointed out in number 6 above, goals are specifically defined and accepted throughout the organization.

We have referred to the budget's prime functions of planning, control, and recording of information. Let us now amplify on these and other points. The planning aspects of a budget are self-evident for the very term "budget" implies a plan of action in the future. What the budget does is to translate this plan into meaningful terms, that is, in terms of dollars and cents. In this respect, the theory of planning and how it relates to budgeting will be thoroughly discussed at a later stage when we analyze the concept and operation of a planning-programming-budgeting system. A budget may also be used as a communication device once plans have been formulated. In order for management's plans to be carried out they must be fully understood by the organization; this will be accomplished to the extent that the budget is set up in a meaningful way by responsibility centres. When planning is undertaken from the bottom up as well as from the top down the budget serves as a sort of commitment between management and the operating supervisor; irregardless of the coercive power of management a well-thought out and properly established budget serves as a stimulus for line management to achieve stated objectives. Finally, a carefully prepared budget is the best possible standard against which to measure actual performance; the budget sets up certain objectives that are to be met by the operating staff. The budgetary system should have built into it certain provisions and techniques (such as operational auditing or information networks systems) that permit management to evaluate the performance of the system and to take corrective action if need be. Management control then is a function of the soundness of

the budgetary system.

Government budgeting in the past, both in Canada and the United States, has not always been carried out, it must be admitted, on a very rational basis. This, of course, can be ascribed at times to political expediency but more important perhaps to a lack of sophisticated techniques (such as cost-benefit analysis) that are now coming forth. Arthur Smithies has given us a profile of the practices of budgeting in the U.S. that can be readily found in Canadian Government⁴; these are summarized below:

generalities

- 1) The costs and benefits of authorized programs are not typically weighed against one another by the administration, the executive nor the legislature.
- 2) Policy is not systematically and explicitly viewed as a problem in the choice among alternative means for the achievement of desired ends.
- 3) Legislative scrutiny of budgetary considerations is ineffective in terms of determining how well objectives are being met and whether objectives are relevant and sound.

These three points bear elaboration; government spending in the

4 - See: Arthur Smithies, The Budgetary Process in the United States; New York, MacGraw Hill, 1965.

past has not been carried out with the view of equating benefits and costs where possible. The fundamental problem for a government or any society for that matter is to achieve certain desired goals with limited means and resources (that is to maximize output with a given input); it therefore becomes imperative that the benefits of proposed expenditures be measured in some way as to indicate whether this is being done. From a legislative point of view the same thing applies. Legislative scrutiny of expenditures should be based not only on the "correctness" or legality of such expenditures; it should also focus on the effectiveness of the spending vis-a-vis stated government goals or objectives. Most committee members in the House of Commons are repeatedly drawn into scrutiny of details rather than of the major expenditure alternatives⁵. This type of analysis is central to a planning-programming-budgeting system.

4) Some major expenditures (or taxation policies) are set or altered as an accident or a by-product of other decisions; that is to say a policy is not always a decision but is often simply done without deliberate and explicit choice (among alternative means for desired ends).

5) There is in the federal budgetary machinery no explicit

5 - For a view of the rather ineffective role of one House committee over the years see: Norman Ward, the Public Purse, Toronto, University of Toronto Press, 1962.

provision for coordinating revenues and expenditures.

The above would seem to indicate a need for certain norms for the budgetary process. Smithies also identifies certain desirable features of a budgetary system in a governmental context; these are

- 1) Governmental objectives should be as clearly and explicitly defined as possible.
- 2) Alternative policies should be explicitly regarded as alternative means toward the achievement of objectives.
- 3) Specifically, expenditure decisions should be made explicitly and deliberately in the light of all the objectives they are intended to achieve.
- 4) Revenue and expenditure decisions should be deliberately coordinated.
- 5) For each expenditure, some systematic and deliberate appraisal of benefits and costs should be made.
- 6) A comprehensive overview of policy-making on expenditures and revenues should be attempted.
- 7) The legislature should undertake a comprehensive and a unified, rather than a segmented, review of the budget; this review should deal not only with specifics but also with broad goals and objectives.

The type of expenditure and policy-making now carried out by government has been termed in the literature the "incremental method"⁶. This process of incremental decision-making is based upon the following preoccupations: a) only a limited set of policy alternatives (e.g. those that are politically relevant) are normally considered; these policies are normally only incrementally different from existing policies; b) analysis of only those aspects of policies with respect of which the alternatives differ; c) a view of the policy choice as one in a succession of choices; d) consideration of only the marginal values of various social objectives and constraints. The concept of value is central to this notion of incremental decision-making. In the incremental method political decision-makers treat values in the same manner as consumers do, that is through marginal comparisons. Though economists have rationalized consumers' choices through the use of utility surfaces on indifference curves⁷ it is doubtful

6 - See: Charles E. Lindblom, Public Finances: Needs, Sources and Utilization, New York, Princeton University Press, 1961.

7 -

The concept of an indifference curve is explained by this diagram; with a given income a consumer will achieve the same total satisfaction by consuming combination A of goods X and Y or combination B (or any other combination along curve cd). His total utility function will be a combination of indifference curves for all possible goods; yet, as noted above, a consumer does not normally think in these terms and will normally rationalize his choice (e.g. make meaningful comparisons) at the margin. Such a process does not obviously lead to an optimal product mix.

whether consumers, through a scientific allocation of their resources, achieve an optimum product mix. Although traditional economic theory tells us that consumers can maximize satisfaction by equating the marginal utilities of different goods consumed it remains a very difficult thing to achieve in reality. Consumers are faced with many problems including lack of product knowledge and the inherent difficulty involved in ranking utilities. More often than not the consumer does not conceive a total utility function and act accordingly; he is more concerned with marginal values. Likewise the incremental decision-maker in government does not make use of a utility function for society (e.g. a social welfare function). His decisions are not based to any extent on a complete analysis of all the variables that might affect welfare, that is the amounts of each and every kind of goods consumed and service performed by every household, the amount of each kind of capital investment undertaken, and so on. Government decision-makers have not concerned themselves with setting broad goals and objectives to be reached, objectives against which results could be measured. In the past very little effort and thought has been given to optimization in government spending. Program budgeting and PPBS is a start in this direction.

Before we move to an analysis of the historical background of program budgeting let us briefly look at the type of budgetary system that has been utilized in the Government of Canada. The Glassco Commission made a thorough study of the budgetary system and recommended wide-sweeping changes from which emerged the present transition to a program budgeting system. The

spending plans of the Government are presented for each fiscal year in the form of Estimates that are tabled in the House of Commons; these Estimates are an indication of what each government department (after consultation with, and approval by, Treasury Board) requires (or feels it requires) in order to carry out its responsibilities and functions. This preparation of Estimates is a continuous process commencing in June of each year for the fiscal year beginning in the following April. In the Estimates expenditures are classified into twenty-two categories known as "standard objects"; also eleven "special objects" are now in use. An example of these standard objects is given in Table I on page 12.

As the Commission points out this system has very little value as a means of planning and control.

"Classification by standard objects increases the tendency to focus attention on the nature of the expenditure rather than on the activity giving rise to it. Instead of a continuous study of all programmes and an assessment of their costs against current need, the review process centres on the lump sum figures shown for the standard objects. Rather than identifying obsolete programmes and reducing the scope of activities where the benefits are marginal, the practice is to reduce the specific figures appearing in the standard classification. The result may leave departmental personnel responsible for achieving objectives without the means they consider necessary"⁸.

8 - Government of Canada, Royal Commission on Government Organization Vol. 1, Ottawa, Queen's Printer, 1963, p. 99.

TABLE ISTANDARD OBJECTS OF EXPENDITURE *

-
- 1) Civil Salaries and Wages
Civilian Allowances
Pay and Allowances, Defence Forces and R.C.M. Police
Pension and Superannuation Account Contributions
 - 2) Travelling and Removal Expenses
Freight, Express and Cartage
Postage
Telephones, Telegrams and Other Communication Services
 - 3) Publication of Departmental Reports and Other Material
Exhibits, Advertising, Broadcasting and Displays
 - 4) Professional and Special Services
 - 5) Rental of Buildings and Works, including Land
Rental of Equipment
 - 6) Repairs and Upkeep of Buildings and Works, including Land
Repairs and Upkeep of Equipment
 - 7) Office Stationery, Supplies and Equipment
Materials and Supplies
Municipal or Public Utility Services
 - 8) Construction or Acquisition of Buildings and Works, including Land
 - 9) Construction or Acquisition of Equipment
 - 10) Contributions, Grants, Subsidies and other Transfer Payments
 - 11) Public Debt Charges
 - 12) All Other Expenditures
 - 13) Less - Estimated Savings and Recoverable Items.
-

* Starting with 1969 Estimates standard objects have been condensed into 13 categories.

Source: Government of Canada, Estimates for the Fiscal Year Ending March 31, 1969, Ottawa, Queen's Printer, 1968.

Another drawback to this system, the Report goes on to say, is that practically no spending authority is delegated to the field with a resulting loss of flexibility. Moreover, classification by standard object fails to provide the legislature with meaningful data in order to permit politicians to assess better (and criticize) government programs. The conclusion reached by the Commission emphasizes the deficiencies of this system:

"The conclusion is inescapable that the present procedures in developing and reviewing the Estimates are wasteful and inefficient. The form of the Estimates does not permit intelligent criticism and, in placing the major emphasis on the nature of expenditure rather than on its real purpose, the matters coming under senior review are the less important details of administrative judgment. Any valid assessment of performance by departmental management is excluded, and it is virtually impossible to form any objective judgment from the Estimates as to the desirability of continuing, modifying, or enlarging specific programmes in the public interest"⁹.

In line with its conclusions concerning the inadequate system of expenditure classification (e.g. the bookkeeping function of the budget as discussed previously in this chapter) the Commission also found that the use of the budget as a tool of planning and control was very weak. Obviously when expenditure classification is done by "standard object" and not by program it becomes extremely difficult to predict what a particular set of programs will cost in five years' time and hence planning tends to be relegated to a secondary role. The Commission stated flatly that "...the present planning procedures of the government are seriously

9 - ibid., p. 96.

deficient"¹⁰. Planning is a matter of determining priorities in the future in the light of stated objectives and limited resources. This, it is safe to say, has not been done with any degree of sophistication in the past.

When we talk of control a word of warning is necessary. If we look at control in a narrow sense, that is, in terms of accountability, in terms of the legality of given expenditures, then the old system is adequate. Parliament is reasonably assured that whatever money it allocates to the executive is spent in a "correct" manner. Indeed it is the work of the Comptroller of the Treasury to ensure that expenditures are properly approved before payment is made. Moreover the Auditor-General provides Parliament with another means of checking whether everything is proper; but management control involves much more than simply knowing who spent what amounts and whether such expenditures were duly approved; management control is primarily concerned with establishing standards and procedures whereby performance can be measured in the light of stated objectives. This, of course, was not done previously; as the Commission points out:

"Objective standards are practically non-existent. While there has been a praiseworthy attempt by the Treasury Board staff to promote the development of more standards of comparison, particularly for activities requiring large staffs performing repetitive functions, such standards

10 - ibid., p. 99.

as have been developed are seldom scientifically based. Little use has been made of modern, highly developed techniques, such as work measurement, cost analysis and statistical sampling. Great advantage will result from the development of a system of review employing modern objective standards for the assessment of all operating activities"¹¹.

In light of the above the Commission made four recommendations, amongst many others, that have provided the impetus for the introduction of program budgeting. These are:

- 1) the preparation of departmental estimates on the basis of programs rather than standard objects of expenditure.
- 2) the elaboration and use of more objective standards for analysis and comparison to be used by senior departmental management and Treasury Board.
- 3) the preparation of long-term plans of expenditure requirements by programs and
- 4) based upon 3) above the annual preparation of an overall forecast of government expenditures and prospective resources for a projected five year period.

Let us now look at the development of the program budgeting concept in the literature as well as the accounting framework inherent in the system.

11 - ibid., p. 99.

CHAPTER II

PROGRAM BUDGETING: BACKGROUND AND ACCOUNTING FRAMEWORK

As noted in Chapter I program budgeting is now being introduced in Canada largely as a result of the work of the Glassco Commission. However, it must be pointed out that the overall concepts of program budgeting (or performance budgeting as it is sometimes referred to) are not new and have been advocated in one form or other for the past fifty-five years. This section will attempt to review, in a cursory manner, the literature of program budgeting and to show how it has evolved over the years.

Burkhead traces the concept back to the Taft Commission of 1912 which had been set up to inquire into the economy and efficiency of the U.S. federal government¹². In essence the Commission proposed, first, a comprehensive executive budget (this had not existed previously); second, a classification system of expenditures based upon programs or functions along with distinction between capital and current expenditures; third, a thorough and systematic review of the budget after the fact. The proposals of the Commission were not implemented until 1921, and then only in part; the Budget and Accounting Act of 1921 required of the President that he submit a comprehensive executive budget

12 - J. Burkhead, Government Budgeting, New York, John Wiley and Sons, 1956, p. 133 et sq.

and established the Bureau of the Budget to support him in this role. The Act however left departmental budgetary procedures unchanged. No further activity along these lines was undertaken until after World War II although the Tennessee Valley Authority in 1934 did set up a budgetary system based upon programs. A most significant step forward was taken in 1949 with the report of the first Hoover Commission. In the immediate post-war period the Bureau of the Budget had spearheaded a complete revision of the accounting procedures in the federal government. The Hoover Commission provided further impetus with its recommendations in its report on Budgeting and Accounting; its first recommendation was that "...the whole budgetary concept of the Federal Government should be refashioned by the adoption of a budget based upon functions, activities, and projects: This we designate as a performance budget"¹³. This view was strongly supported by the task force which had studied the budgeting and accounting systems for the Commission. This recommendation was made a legislative requirement by the National Security Act Amendments of 1949 and the Budgeting and Accounting Procedures Act of 1950. The Second Hoover Commission¹⁴ in 1955 recommended a "program budget"; it also noted that this program budget should be supported by detailed information on program costs and accomplishments. At this point

13 - Commission on Organization of the Executive Branch of the Government, Budgeting and Accounting, Washington, 1949, p. 8.

14 - For a thorough review of the work of this Commission see: N. MacNeill, H.W. Metz, The Hoover Report, 1953-1955, New York, The Macmillan Company, 1959.

we have to deal with a problem of semantics; although "performance" and "program" budgeting are often used interchangeably they are not synonymous; as Burkhead points out the concepts of "program" and "performance" may be "distinguished according to their time dimension"¹⁵. Performance budgeting, as the word implies, is essentially concerned with the past whereas program budgeting, according to Burkhead, deals with future achievements: "In the preparation of budget estimates, program determinations should precede and set the framework in which the measurement of performance can be undertaken"¹⁶. This introduces the dimension of planning in the budgetary process. In retrospect the Second Hoover Commission and the subsequent work of the Defense Department laid the groundwork for the development of the Program Planning and Budgeting System. As a result, the Defense Department under the leadership of the Controller, Charles Hitch, developed a five-year defense program and introduced the use of cost-effectiveness techniques to compare program plans.

The McNamara era in the Defense Department focussed public attention on these new decision-making tools such as cost-benefit analysis and the program planning-budgeting system. Faced with rapidly-mounting defense expenditures McNamara turned to PPBS in order to rationalize the whole defense program. He explained his management philosophy in these terms:

15 - Burkhead, op. cit. p. 139.

16 - ibid.

"It is through this system that we look at the defense effort as a whole. Major program priorities can be meaningfully determined only in terms of the total program, and a proper balancing of all the elements of the defense effort can only be achieved at the Department of Defense level. For example, the size of the Polaris force cannot be determined in terms of the Navy shipbuilding program or even the entire Navy program, but can be validly judged only in relation to all of the other elements of the strategic retaliatory forces - the B-52's, the Atlas, the Titan, and the Minuteman ICBM's. Similarly, the requirement for Air Force tactical fighters cannot be determined independently of the requirement for Army ground forces. All such interdependent decisions must be made at one place in the defense organization, and in this process the Joint Chiefs and the Secretary must play a major role. Alone among the elements of the Department, they have the overall vantage point from which to reach sound recommendations on balanced military forces.

While I believe that unified planning, programming, and decision-making are indispensable to the effective management of the defense effort, I am equally convinced that the actual operation of the program should be managed, to the maximum extent possible, on a decentralized basis. The defense effort is entirely too big, too complex, and too geographically dispersed for its operations to be managed from a single, central point.

Thus, the organization and management of the Defense Department must be based on the principle of centralized planning and decentralized operation"¹⁷.

This so-called MacNamara type of analysis gained prominence and importance from its inception and culminated in its proposed

17 - W.W. Kaufman, The MacNamara Strategy, New York, Harper and Row, 1964, p. 169.
See also: B.M. Gross, "MacNamara Management", Public Administration Review, Sept. 1965.

implementation throughout the United States Government's activities¹⁸. President Johnson on August 25, 1965 announced the introduction of a new planning-programming-budgeting system in the U.S. federal government (starting in 1968). The system has as its aims the following:

- "1) Make available to top management more concrete and specific data relevant to broad decisions;
- 2) Spell out more concretely the objectives of Government programs;
- 3) Analyze systematically and present for agency head and presidential review and decision possible alternative objectives and alternative programs to meet those objectives;
- 4) Evaluate thoroughly and compare the benefits and cost of programs;
- 5) Produce total rather than partial cost estimates of programs;
- 6) Present on a multiyear basis the prospective costs and accomplishments of programs;
- 7) Review objectives and conduct program analyses on a continuing, year-round basis, instead of on a crowded schedule to meet budget deadlines"¹⁹.

18 - Credit must also be given to such writers as David Novick and others who have written profusely on the subject since the mid-1950's. The most comprehensive work on program budgeting remains that of D. Novick, Program Budgeting, Cambridge, Harvard University Press, 1965.

19 - U.S. Bureau of the Budget, Planning-Programming-Budgeting, (Bulletin 66-3, October 12, 1965), pp. 1-2.

In Canada, as we have said, the Glassco Commission provided the main impetus for the introduction of program budgeting. The Commission recommended in its report that the Treasury Board be separated from the Department of Finance and become a separate department. This took place formally on October 3, 1966; the new Treasury Board in fact became the manager of the public service. One of the functions assigned to it was to implement the Glassco recommendations²⁰. In 1963, as a result of Treasury Board urging consultants were hired to review the possibility of implementation of the main Glassco proposals; four departments, Transport, Agriculture, Northern Affairs and National Resources, and Veterans Affairs were chosen to initiate the new financial management system. In 1965 an internal (e.g. in Treasury Board) consulting group known as the Accounting Advisory Services was created; this led to the issuing of a comprehensive financial management guide²¹. In March, 1967, an Estimates manual based upon programs of expenditures was published,²² replacing the "Estimates Manual" issued in 1956. A program budgeting guide aimed mainly at senior management was

20 - See Appendix I for an organization chart of the Treasury Board.

21 - Government of Canada, Financial Management in the Departments and Agencies of the Government of Canada, Ottawa, Queen's Printer 1966.

22 - Government of Canada, Program Review and Estimates Manual, Ottawa, Queen's Printer, 1967.

published in July, 1968²³. Chapter 5 of this study will deal at greater length with the extent of implementation of program budgeting as well as the problems encountered²⁴.

The Accounting Framework

We now turn to a description of the accounting framework in a program planning and budgeting system. In other words, we want to know what the term "program" refers to. Program classification aims to replace the coding of government expenditures based upon "standard objects" of expenditure with classification by programs. A program is "a major departmental function designed to achieve specified objectives that have been authorized by Parliament".²⁵

23 - Government of Canada, Planning, Programming, Budgeting Guide, Ottawa, Queen's Printer, 1968.

24 - Although no attempt is made in this study to assess the impact and development of program budgeting outside the U.S. and Canadian federal governments it must be noted that the literature reflects a growing awareness on the part of writers in Europe and elsewhere of the potential of the system. For example see: H.J. Hofstra, New Techniques of Budget Preparation and Management, Brussels, International Institute of Administrative Sciences, 1963; A.K.M. Kabir, "Performance Budgeting: Its Application in Pakistan", International Review of Administrative Sciences, Vol. 33 (1967), No. 4. Attempts at implementing program budgeting at the state government level in the U.S. have also been documented; specifically see: D.S. Vaughan, "State Budgeting in the United States", Public Administration Survey, January, 1968, also R.S. Gilmour, "A Planning-Programming-Budgeting System", Proceedings of the Conference of the Academy of Political Science, New York, January, 1967; D.J. Alesch, "Government in Evolution: A Real World Focus for State Planning", Public Administration Review, May-June, 1968. Performance budgeting at the local government level has been covered by Sherwood and others in Public Administration Review, March, 1960.

25 - Financial Management Guide, op. cit., p. 17.

An example would be resource development in the Department of Northern Affairs and National Resources (now Indian Affairs and Northern Development). Sound program definition or delineation is essential to the success of the system. There are certain requirements that must be met in defining a program:

- 1) every program must be authorized by legislation, either directly or indirectly, and described in such a way as to give Parliament, the Executive, and management a clear insight into its purpose and objectives;
- 2) a program should permit comparison of alternative methods of pursuing certain policy objectives that are at times imperfectly determined; this may be very difficult at times for some programs may consist of a number of complementary components and cause overlapping structures; also the time element involved may present some difficulties;
- 3) the cost of a given program must be readily ascertainable;
- 4) a program must be capable of assignment to a specific person who can then be held accountable for the achievement of that program.

Since a "program" can involve quite a sizeable area of government activity it becomes imperative for managerial purposes to break down or subdivide programs into activities and responsibility

centres²⁶. Activities will normally be further divided into sub-activities; this process will continue up to the point where the last unit describes a concrete intended operational result such as X number of items produced or shipped per unit of time. Obviously this process is both an important and a difficult one; departmental experience together with Treasury Board guidance should lead ultimately to an efficient breakdown of work into activities and sub-activities. In general terms an activity when described should have the following characteristics:

- i) be easy to identify in terms of work done to meet a given objective
- ii) be easily and clearly related to a program
- iii) be of such a nature that it can be costed and carried out economically and effectively.

For every activity and sub-activity there must be a responsibility centre. This is the key to the whole system; once activities have been defined someone must be held responsible for that activity (or sub-activity). This in turn entails the granting of authority to the appropriate operating manager; a manager's accountability, quite obviously, will depend upon his having the authority to manage assigned resources. It must be pointed out that a centre may be responsible for more than one activity and correspondingly an activity may be carried out by more than one responsibility

26 - See Appendix II for a graphical example of program breakdown.

centre. The whole process of subdivision into activities and responsibilities should enable a department to:

- "a) establish priorities among existing and contemplated activities;
- b) weigh prospective benefits against related costs and estimate the effects of a cutback or expansion of existing programs, or the introduction of new programs;
- c) take into account foreseeable changes in the need for services and corresponding changes in levels of operations to meet those needs; and
- d) establish accountability for carrying out the program and for the estimate and control of expenditures and revenues associated with the program"²⁷.

The preceeding analysis has given us a framework within which it is now possible to study in depth the planning and control orientations of a program budgeting system in Chapter 3. Discussion of the actual "mechanics" of budget preparation and approval is not attempted here although some reference to the budgetary process per se will be made at a later stage²⁸.

27 - Financial Management Guide, p. 18.

28 - For a detailed analysis of the mechanics of budget preparation and approval, as well as accounting systems and operations see Financial Management Guide, Chapters 5 and 6.

CHAPTER III

PLANNING AND CONTROL

We have not up to this point talked of the planning and control dimensions of program budgeting; Chapter II merely set out the accounting framework within which planning and control must take place. This chapter will analyze the planning and control functions from two perspectives: the theory and the techniques involved; Chapter V will look at the planning and control processes in operation in a government department.

A planning-programming-budgeting system is radical because it is output oriented whereas traditional budgeting systems have tended to be more input oriented. PPBS concentrates on the total aspect of government spending; that is, it focusses upon the benefits received from the output rather than solely upon the input resources. In order to do this intensive study must be undertaken of the alternative ways of reaching certain desired objectives. This is necessary in order to minimize costs and maximize output. The government spending process can be seen as a series of alternative goals or objectives that must be met or satisfied with a limited amount of resources. Figure I shows this relationship: any of the various objectives could justify the spending of twice the yearly budget of the whole government and in some areas this probably would not be enough; as this is obviously not feasible for any government has many objectives

FIGURE I

which it must pursue simultaneously there must be some form of rational allocation of the scarce resources in order that the total government output be optimized. A planning-programming-budgeting system attempts to do this rationalization. In essence the system can be reduced to five basic propositions:

- (a) the framing of budgetary proposals in terms of programs directed toward the achievement of specific objectives;
- (b) systematic analysis to clarify objectives and to assess alternative ways of meeting objectives;
- (c) the projection of the costs of these programs a number of years in the future;
- (d) the formulation of plans of achievement year by year for each program; and

- (e) an information system for each program to supply data for the monitoring of achievement of program goals and to supply data for the reassessment of the program objectives and the appropriateness of the program itself.

Point (a) has been covered in previous chapters; emphasis has been taken away from "standard objects" and placed upon programs which are set up on the basis of activities and responsibility centres. Our attention must now shift to the planning and control functions. This will lead us to the theoretical aspects as well as the actual techniques that will be utilized with the implementation of the system.

Planning and control aspects

The first question that comes to mind is "why do we need to plan ahead and implement controls that help accomplish a stated plan?" The reason is deceptively simple: government spending, especially in the post-war years, has been increasing at a very rapid rate and will undoubtedly continue to do so in the years ahead. Given our limited resources every effort must be made to insure that government spending brings about the greatest benefits possible within the limits set by given stated priorities. Table II shows how spending by the Federal Government has grown in the post-war years.

TABLE II
EXPENDITURES OF GOVERNMENT OF CANADA²⁹

(millions of dollars)				
<u>1946</u>	<u>1951</u>	<u>1956</u>	<u>1960</u>	<u>1967</u>
2,634	3,732	4,849	5,958	8,798

NOTE - As per Public Accounts; figures shown are for budgetary transactions only.

If we include non-budgetary items of expenditure the total of the fiscal year ending March 31, 1967 exceeds ten billion dollars. There has also been a substantial shift in the major categories of expenditure as Table III indicates.

TABLE III
EXPENDITURES BY FUNCTIONS³⁰

	<u>1946</u>	<u>1953</u>	<u>1967</u>
Defence	80%	53%	19%
Social Affairs	6%	25%	23%
Transportation	2%	5%	12%
Resources	1%	2%	10%
Grants to provinces	2%	1%	6%
Public debt charges	1%	4%	16%
Others	1%	4%	16%

29 - Source: Public Accounts of Canada, yearly issues. See also M.C. Urquhart and K.A.H. Budkley, editors, Historical Statistics of Canada, Toronto, MacMillan, 1965, pp. 197-201.

30 - ibid.

The most notable shift was in defence expenditures which decreased from 80% to 19% of total expenditures with social affairs, transportation and resources showing substantial percentage increases. This massive increase in spending demands a more rational system of allocation of funds than we have had in the past. The Honorable E.J. Benson, Minister of Finance, has stated the case in these terms: "In the past the science of public finance centred mostly upon the study and research of taxation and to a degree on the study of fiscal and monetary policy; unquestionably governments cannot afford to neglect those sectors as they must carefully consider debt and monetary policies. But without at least equal consideration of the expenditure sector the economic capacity of the state must suffer"³¹.

The Economic Council of Canada in its Fourth Annual Review acknowledged this lack of analysis of expenditures in a benefit-cost framework. It had the following comments to make regarding government budgeting:

"The Council endorses the preliminary steps which have been taken towards more effective programme budgeting and systems analysis. But we believe that there are very considerable opportunities for improving government processes of decision-making in this field through greatly reinforced and extended development and application of appropriate techniques, in particular for:

-better and longer-range planning of government

31 - E.J. Benson, "Budget Breakthrough: Adoption of PPB", Canadian Tax Journal, May-June, 1968, p. 161.

expenditures which we have strongly emphasized in our earlier Reviews;

- systematic techniques for planning-programming-budgeting to facilitate selection of the most effective means of achieving given objectives;
- the further development of techniques for cost-benefit analysis of an increasing number of government activities; and
- the application of new and increasingly sophisticated techniques for testing the possible impact that various alternative patterns of expenditure and tax changes may have on the economic system"³².

The Council identified four basic questions which must be asked in relation to the government's spending programme:

- "(1) What are the purposes to be served by a given programme of expenditures and is the given programme the most effective way of serving these purposes?
- (2) Are the purposes or the anticipated results of any programme inconsistent in some ways with the purposes and results from other programmes, and how can such inconsistencies be eliminated?
- (3) What are the benefits in relation to the costs involved?
- (4) What are the effects on the whole economic system of different tax or expenditure changes, as these work themselves out over time under changing conditions?"³³

It is precisely this lack of foresight or long range view of government spending that a PPB system attempts to overcome.

32 - Economic Council of Canada, Fourth Annual Review, Ottawa, Queen's Printer, 1967, p. 263.

33 - ibid, p. 262.

Planning, both on a short term and long term basis lies at the heart of a PPB system and as such must be analyzed thoroughly both in its theoretical and practical aspects.

Planning

The term "planning" is widely used in management circles and at the same time widely misunderstood by many practitioners. Too often lip service is paid to planning as a panacea for all of management's problems without adequate consideration being given to the theory of planning, the uses to which it can be put as well as the limitations inherent in the planning process itself. This section will concern itself first, with the theoretical aspects of planning after which we shall analyze the actual planning process in a planning-programming-budgeting system.

Planning has been defined in a leading public administration text as

"that activity that concerns itself with proposals for the future, with the evaluation of alternative proposals, and with the methods by which these processes may be achieved. Planning is rational, adaptive thought applied to the future and to matters over which the planners or the administrative organizations with which they are associated, have some degree of control"³⁴

Pfiffner and Presthus give a rather involved definition of planning:

³⁴ - H.A. Simon, D.W. Smithburg and V.A. Thompson, Public Administration, New York, Alfred A. Knoff, 1967, pp. 423-424.

"Planning is essentially a means of improving decisions and is therefore a prerequisite to action. It seeks to answer two vital questions: What is the purpose of an agency or a program, and what are the best means of achieving that purpose? However, policy organization, and the social environment are in constant state of flux. This means that planning must be continuous and dynamic; it must anticipate change. Very broadly, administrative planning must consider political ends and the appropriate ways of achieving them. It must design effective operating procedures and provide supervisory techniques which will ensure that what has been planned is in fact being achieved. In the process planning touches upon every aspect of management, including decision-making, budgeting, coordination, communications, and problems of structure. Planning, in a word, is management"³⁵.

One leading business textbook gives the following definition of planning: "an organizational plan is any information output from a substantive decision transformation which either specifies or guides the taking of future actions by its members geared toward overcoming existing or anticipated problems"³⁶.

The definition which appears to be the most straight forward while at the same time incorporating all of the important elements of the planning process is the following: "Planning is the process of preparing a set of decisions for action in the future directed at achieving goals by optimal means"³⁷. Inherent

35 - J.M. Pfiffner and R.V. Presthus, Public Administration, New York, The Ronald Press, 1960, p. 83.

36 - M.D. Richards and P.S. Greenlaw, Management Decision-Making, Homewood, Illinois, Richard D. Irwin Inc., 1966, p. 293.

37 - Y. Dror, "The Planning Process: A Facet Design", International Review of Administrative Sciences, Vol. XXIX, 1963, p. 50.

in this definition are seven elements.

- 1) Planning is a process; it is a continuous activity within an organization. It requires an input of resources and the application of some activity to those resources in order to sustain the process. Planning is therefore not synonymous with a plan; a plan is defined as a "set of decisions for action in the future". A plan may be set up as a result of a formal planning procedure or through some other methods of decision-making whether formal or informal, rational or irrational.
- 2) Planning is a managerial function; however, this does not imply that the planning process is or should be a one-way street. For any plan to be effective it must be established from the top down as well as from the bottom up. Top management is in a better position than the line manager to see the over-all operations of the organization and consequently at setting broad policy and general framework within which the plan is to be established. Line management, on the other hand, is more familiar with the operational capacity of the organization and can thus offer valuable advice on the mechanics and the feasibility of the plan. This introduces the commitment concept to which we shall return later.
- 3) Planning is not decision-making. As Dror puts it "while planning is a kind of decision-making its specific characteristic in this respect is its dealing with a set of decisions

i.e. a matrix of interdependent and sequential series of systematically related decisions"³⁸. Decision-making takes place within a planning context and as such is a very important part of a manager's job. A later section in Chapter IV will deal with the theory of decision-making as well as the newer techniques utilized in management decision-making.

- 4) Planning is directed at action. Too often organizations develop plan after plan which end up by never being implemented. The purpose of planning is to achieve some objective (s) although planning, if it is soundly under-taken, should have some side results such as executive-development, improved decision-making, greater staff involvement etc... But these must always remain secondary considerations; planning is essentially "action" or "execution" oriented.
- 5) Planning deals with action in the future. This notion is central to an understanding of the limitations of planning. The future is always unpredictable to a certain extent and no planning system can completely anticipate the forces that will be exerted on the organization at some future time. What proper planning can accomplish, however, is to condition those situations where uncertainty is a factor; that is, to

38 - ibid., p. 51.

narrow or delineate the boundaries of uncertainty in which the organization must function.

- 6) Planning must be directed toward the achievement of certain specified goals. This does not imply that the formulation of goals or objectives is an easy thing to accomplish; in a government context just the opposite is quite often true. Yet if the budgetary process is to be rationalized policy must be translated into certain very specific goals.
- 7) Lastly, planning is concerned with achieving certain goals by optimal means. Dror puts it in these terms: "The planning process is directed at suggesting the optimal means for achieving our goals, i.e. at selecting on the basis of rational processes - including collection of information, utilization of knowledge, systematic and integrative data processing, - the optimal strategy for achieving the desired goals. The basic problem of planning methods, procedures and techniques, is provision of ways for identification of these optimal means with a minimum of input of resources"³⁹. This introduces the concepts of optimization and sub-optimization which will be covered in chapter IV.

Much of the literature on planning deals with certain given situations and/or organizations. There is no "general theory of planning" although a few attempts have been made to arrive at such

39 - ibid., p. 51.

a theory. One example is set out below:⁴⁰

FIGURE II

DIMENSIONS OF A PLAN

Applicable Theory	Procedure	Applicable Theory
Communication and persuasion	1. Awareness of need	Need determination
	2. Statement of objective	Testing
	3. Outline of proposal	Data collection and processing
	4. Obtaining approval	
	5. Organizing planning staff and assigning responsibility	Organizing for planning
	6. Specific outline of plan	Communication and persuasion
	7. Establishing contact with all cooperating units	
Choice	8. Obtaining and processing necessary data	Data collection
	9. Evaluating data	
	10. Formulating tentative conclusions and preparing tentative plans	
	11. Testing components of tentative plans	
	12. Preparing final plans	
	13. Testing plans	
	14. Obtaining approval of plans	

The preceeding graphical presentation of the theory of planning is divided by the authors into seven sub-theories:

40 - P. LeBreton and D.A. Henning, Planning Theory, Englewood Cliffs, New Jersey, Prentice-Hall 1964, p. 58.

1. Theory of need determination
2. Theory of choice
3. Theory of data collection and processing
4. Theory of testing
5. Theory of organizing for planning
6. The role of communication theory in planning
7. The role of persuasion theory in planning

Other authors see the planning process in narrower terms involving three phases: value formulation, means identification, and lastly effectuation⁴¹. For our purpose the planning process will be subdivided into five distinct phases: determination of objectives, assessing of alternatives, arranging for necessary resources, outline of planning organization, and elaboration of a formal plan. The above will take place at the departmental level after the basic policy has been established by the Government. Before analyzing planning in its managerial aspects we must first examine the policy framework within which departments must plan. Chart III on page 39 shows how planning is carried out at the Government level⁴².

41 - P. David and T.A. Reiner, "A Choice Theory of Planning", Journal of American Institute of Planners, May, 1962, p. 106.

42 - In this context planning should perhaps be referred to as "policy-making" with the term planning restricted to departmental activity although in practice the role departments play in policy-making is a very important one.

The author would like to acknowledge the invaluable help of Mr. M. Zelman of the Treasury Board in providing flow-charts of the Government planning process.

CHART III

For purposes of program budgeting all government spending activity is classified within six main areas or functions according to the Planning Programming Budgeting Guide. General Government, Foreign Affairs, Defence, Economic Measures, Social Measures, and Education, Culture and Recreation. Moreover Fiscal Transfer Payments to provinces and Public Debt transactions constitute two special categories; at this stage one can talk of objectives only in a very general way: the Government will have to decide how the revenue pie is to be shared amongst the various functions; that is, whether one third of the budget should be spent on defence, one quarter on economic measures and so on. This decision does not lend itself readily to managerial techniques such as systems analysis; indeed such a decision, it must be admitted, is more likely to be a political one. What this functional classification does accomplish, however, is to give the Government a more precise idea of where expenditures will be undertaken in order to reach certain stated goals. This brings in step II which is one of defining sub-functions and sub-objectives. Each major function is broken down into several sub-functions and functional programs. An example is shown in Table IV on page 41. Having decided to increase spending on social measures the Government can then decide still in a general way to concentrate on one sub-function rather than another (e.g. an increase in social assistance through the functional programs listed under that heading rather than on increases in income maintenance programs).

TABLE IVSOCIAL MEASURES

HEALTH

Public Health
Medical Care
Hospital Care
Other Health

INCOME MAINTENANCE

Payments to Aged
Payments to Families
Payments to Unemployed

SOCIAL ASSISTANCE

Canada Assistance Plan
Aid to Handicapped
Other Social Assistance³

VETERANS' BENEFITSINDIANS & ESKIMOSOTHER SOCIAL MEASURES

Source: Planning Programming Budgeting Guide, op. cit., p. 31.

The various decisions on whether to increase spending or not, or on the composition of expenditures will be a function of the input as shown in Chart III. First and foremost government spending always has been and always will be influenced greatly by political considerations. There will always be pressures upon Government to cater to one given area or group rather than another.

Program budgeting does not purport to eliminate this; however an efficient program budgeting system should, by showing costs and benefits in a proper perspective, pinpoint for managers and legislators the advantages or disadvantages of given government programs and thus narrow down the scope for purely political decisions or else show the costs of decisions taken.

The fiscal input is of primary importance. It is this input which limits the over-all size of the spending program. This input is provided primarily by the Department of Finance. The tasks of the fiscal department have been treated at length by Musgrave⁴³; these are allocation of resources, distribution of costs and stabilization and growth. Without elaborating on this we can generalize and say that the fiscal department must insure that proposed expenditures, both short-term and long-term, are in line with existing and future sources of revenue, namely taxation and borrowing. Also the fiscal department must insure that proposed expenditures are undertaken in conjunction with stated policies of full employment, economic growth and price stabilization. Governments accomplish these objectives through the expansion or contraction of demand for consumption and investment by the use of broad fiscal or monetary tools. The government can also use fiscal tools selectively by the introduction of varia-

43 - See: Richard Musgrave, The Theory of Public Finance, New York, McGraw-Hill, 1959.

tions in the amount of subsidies and transfer payments, depreciation and tax incentives as well as direct expenditures on goods and services. These may be used singly or in combination to affect the level of demand. Apart from short-term effects fiscal policy has implications for long-term growth measures for stimulating investment, upgrading the level of skills, removing barriers to resources mobility, etc.... The prime responsibility for the above lies with the Branch of the Department comprising the Division of Economic Analysis and the Division of Government Finance. These Divisions are concerned with appraisal and forecasting of economic and employment conditions, the Gross National Product and Expenditures, balance of payments, security markets, government bond issues, Public Debt management, Exchange Fund and the International Monetary Fund. Other divisions, such as the recently formed Fiscal Policy Division, also play an important role.

The third input referred to in Chart III is that of program submissions. A program review submission is a set of annual documents which sets forth for Treasury Board's consideration and approval a department's plan for the ensuing five years along with the financial requirements of these plans and their economic justification. In the Estimates the financial requirements outlined are projected for the Estimates year and the four succeeding years; there is also a two-fold comparison made with actual expenditures for the past year and

forecast expenditures for the current year. The exact format of program submissions is set out in detail in the Program Review and Estimates Manual⁴⁴. Submissions are intended to provide Treasury Board with an opportunity for reviewing departmental objectives, plans and priorities as well as to give departments a chance to clarify in their own minds their objectives and problems resulting there from. Having these plans in hand will permit Treasury Board to determine priorities which will reflect the broader needs of the government as a whole taking into consideration other inputs to the process as shown in Chart III (e.g. political, fiscal, etc...) We shall expand on the program submissions procedure in the section covering departmental long-term and short-term planning.

The last input to be considered is that of others. This refers to private agencies or organizations which are outside the political sphere (but not necessarily outside the machinery of government) and which might serve as useful sources of information and/or criticism concerning past and proposed government spending programs. Without making an exhaustive survey of such possible inputs we might look more closely at one, namely the Economic Council of Canada. The Council was set up in 1963 to:

44 - See: Treasury Board, Program Review and Estimates Manual, p.302.

advise and recommend to the Minister how Canada can achieve the highest possible levels of employment and efficient production in order that the country may enjoy a high and consistent rate of economic growth and that all Canadians may share in rising living standards.⁴⁵

Amongst the more specific duties of the Council the following appear to be the most relevant for our discussion:

- (a) regularly to assess, on a systematic and comprehensive basis, the medium term and long-term prospects of the economy, and to compare such prospects with the potentialities of growth of the economy;
- (b) to recommend what government policies, in the opinion of the Council, will best help to realize the potentialities of growth of the economy;
- (c) to study how economic growth, technological change and automation, and international economic changes may affect employment and income in Canada as a whole, in particular areas of Canada and in particular sectors of the economy;
- (d) to study and discuss with representatives of the industries concerned and with representatives of labour, farmers and other primary producers, and other occupational groups and organizations, what specific plans for production and investment in major industries in Canada will best contribute to a high and consistent rate of economic growth;
- (e) to study how national economic policies can best foster the balanced economic development of all areas of Canada;
- (f) to seek full and regular consultation with appropriate agencies of the governments of the several provinces.

45 - Economic Council of Canada Act, (12 Elizabeth II, Chapter II).

Every effort should be made to insure that clear channels of communications exist between the Government and organizations such as the Council.. This can lead to an invaluable cooperation between Government planners and groups which have more expertise in certain areas. For example, the Economic Council in its Fifth Annual Review criticized extensively economic policies designed to achieve or stimulate regional economic growth on the grounds that more often than not such policies either overlapped unduly or were even apt to produce opposite results. This type of advice when it is based on sound reasoning and logical analysis can help to re-orient certain government programs so that their effectiveness is enhanced. Unfortunately, in Canada we lack the type of institutions that could play this role continuously such as is the case in the United States with the Rand Corporation and the Brookings Institution. It would appear however that we are moving more toward this system in Canada. This would greatly strengthen the work of the Economic Council, the Bank of Canada and other similar groups in this respect.

The next step in the Government planning process is that of defining Government priorities using the information flow provided by the various inputs described. This final decision remains a function of the cabinet. The cabinet committee structure was completely revamped in April 1968; in the words of the Prime Minister "this restructuring should result

in increased efficiency in dealing with particular items of business but at the same time should permit more time and attention to be concentrated on the task of planning and policy development"⁴⁶. There are now four major Standing Committees: External Policy and Defence; Economic Policy and Programs; Communications, Works and Urban Affairs; Social Policy. In addition to the four major functional committees there are four main coordinating committees: Priorities and Planning; Legislation and Planning for the House of Commons; Treasury Board; Federal-Provincial Relations. The Committee on Priorities and Planning's essential purpose is to review priorities and planning of Government policy and to give special attention to questions which have important long-term implications. It is upon this Committee (and also Treasury Board) that the burden of the work regarding planning will fall.

Once priorities have been established departmental plans, which will be a reflection of government priorities, will be approved and become operational⁴⁷.

46 - Office of the Prime Minister, Press Release, April 30, 1968, p.1.

47 - In Chart III the two last stages (e.g. determination of priorities and approval of departmental plans) are shown in a vertical relationship which might lead to some confusion; it must be pointed out that the relationship is more of a horizontal one with the determination of priorities being a dynamic rather than a static process due to changes in various inputs; this will require a continuous re-appraisal of departmental plans in light of these possible changes.

Departmental planning has two time dimensions: long-term planning and short-term planning and plan implementation. Chart IV on page 49 presents a flow chart of departmental long-term planning. The first and most important step is that of defining departmental objectives. Most departments of government have over the past evolved quite often in a hodge podge way and consequently lost sight of their basic objectives or purposes. This statement might have a tendency to offend certain departmental managers yet it is quite true that any formal organization must constantly reassess its role and objectives lest it become static and stagnant. In administration dynamism is not a self-perpetuating process; it needs to be fed and nurtured in order to survive. The Program Budgeting Guide states this first point very clearly:

The first step in the implementation of program budgeting from a departmental point of view is the formulation of a statement of objectives which indicates which function or functions of government the department exists to support and what specific contributions the department makes or proposes to make. The statement of objectives is, therefore, fundamental in that the particular structure which evolves will be directly dependent on the objectives and the way in which they are stated. Successful planning is critically dependent on the clarity of objectives at all levels - governmental, departmental and the levels of departmental program, activities and sub-activities⁴⁸ or projects carried on within the scope of each activity.

Certain departmental objectives may be related solely to one of the government functions referred to earlier (e.g. social measures

48 - Planning Programming, Budgeting Guide, op. cit., p.5.

and economic measures). Once this has been done there must be a breakdown into sub-functions and sub-objectives in the same manner as was described previously for total Government planning (e.g. Chart III page 39). Even at this level further breakdown is necessary in order to bring the objectives and sub-objectives down to the operational level; this involves the defining of the program-activity structure. Departmental objectives and sub-objectives must be related to specific programs which in turn are to be broken down into activities and responsibility centres.⁴⁹ Sound program planning in itself is dependent upon four elements: a precise description of the objectives (and sub-objectives) to be reached, one or more plans of action to meet the objectives including alternative plans that may have to be utilized in the case of a reduction in available resources, measures to assess the effectiveness of given programs and finally measures to assess their efficiency. This will involve the use of system and cost-benefit analysis although it must be emphasized that in long range planning it still remains quite difficult to pinpoint with accuracy the efficiency or effectiveness of any project or program however sophisticated the techniques of analysis. We shall postpone our discussion of the techniques involved until Chapter IV.

⁴⁹ - The actual mechanics involved in defining programs and activities will not be covered at this point; this is discussed and illustrated in Financial Management Guide, op. cit., p. 16 et sq.

When the departmental objectives and the program-activity structure have been approved by Treasury Board the task of optimizing the various programs and determining their costs begins. This is shown in Chart IV by the boxes immediately following "Treasury Board Approval". First, interrelations of activities and spillovers must be determined; this is necessary in order to insure that there is a minimum of overlapping between different programs and activities. It is at this stage that sophisticated management techniques come into use; systems and cost-benefit analysis will be utilized to insure as much as possible the optimization of activities and, ultimately, programs (that is, maximum output with minimum input). Once an optimum program structure has been established or defined alternative ways of achieving the programs objectives must be laid out along with the financial implications of each alternative. This is the last step before Treasury Board approval which approval (or rejection) will be influenced by the interaction between itself and the Cabinet Committee on Priorities. The end result should be the approval of one of the alternatives with its particular budgetary requirements. This process will be repeated for all of a Department's programs and all Departments with the end result being a comprehensive plan showing proposed government spending for the next five years.

As comprehensive as this process appears to be the key to its success lies in its flexibility. Over the course of a

five year period many variables will change with the result that proposed plans may have to be modified; these variables might be changes in the political situation, a domestic economic crisis, changes on the world scene, and so on. Yet if it remains flexible, as it must, this type of planning can be an invaluable tool to government decision-makers by providing them with certain guidelines, certain limits within which they may direct their activities. It should also render decision-making more meaningful by relating it to broader long-term goals. Let us now see how departmental short-term planning and implementation fits into this framework.

We have already noted that departments make two submissions annually to Treasury Board: the Program Review and the Main Estimates. In what way do these submissions fit into the planning process as outlined up to this point? The first submission, the Program Review, sets out a department's plans for the next five years. This document contains:

- departmental schedules in summary form with a brief supporting narrative;
- program summary schedules showing financial and personnel requirements and alternative budget levels and disclosing, in the "program summary by activity" schedule, receipts credited to the consolidated revenue fund and "free service" costs for the program as a whole. These are supported by narratives describing the program and its components and

- highlighting significant changes in the period under review;
- activity summary schedules showing personnel and financial requirements and providing performance indicators for each activity. These in turn are supported by schedules showing the details of requirements with emphasis on priorities, trade-offs and alternative budget levels. Activity memoranda explain requirements in terms of the goals and objectives considered in preparing the Program Review submission and provide cost analyses to show the basis of determining the resources required to carry out the proposed plans; and
 - supporting schedules and narratives detailing revenue and allocated costs which pertain to each program.

The Main Estimates translate the Program Review plans into the operational stage; after the long-term plans have been approved, reviewed and targets set the Main Estimates submissions converts the approved plans into specific resource requirements. In terms of a time dimension the former focusses on a five year period while the latter looks at one year (e.g. not calendar but fiscal year). With approval being given to a department's estimates by Treasury Board then short-term planning and plan implementation will go into effect. This process is shown in Chart V on page 54.

In Chart V we start off with a box showing approved departmental program(s), program-activity structure, one year budget, and long-term plan. With these various steps being approved the emphasis now shifts to projects for, ultimately, program objectives will only be met through the completion of different individual projects. A project will contribute to program objectives in one way while another project will have another completely different contribution to make. It is therefore important to define precisely what the goals of a project are. Having done this, the manager will then have to break the project down into certain activities: this step is labelled "define activity-project structure" in Chart V. Departmental approval must then be given to this complete process before any further action can be taken (departmental refusal is shown by a "no" loop in Chart V bringing the process back to the "define project goals" stage). Providing approval is given then a systems and cost-benefit analysis of various activities will be undertaken in order to rationalize and optimize the activity breakdown. Should this analysis show that certain activities are not feasible the process is again halted with a loop going back to the "define project goals" stage or even further back into the department's long range plan. The last three stages after the technical feasibility analysis involves the allocation of project priorities (based upon resources available, the time-span in question, etc...), the approval of the projects in question and finally the implementation.

The implementation stage is a crucial one. At this level care must be taken to insure that a) projects have been rationally set out and b) once adopted, that the work flow on a given project adheres to a strict time sequence. The most valuable tools available to the manager in this respect are that of PERT (Program Evaluation and Review Techniques) and CPM (Critical Path Method). PERT has been defined as

"a method of minimizing production delays, interruptions, and conflicts; of coordinating and synchronizing the various parts of the overall job; and of expediting the completion of projects. It permits the turning out of work that is controlled and orderly. It is a method of scheduling and budgeting resources so as to accomplish a predetermined job on schedule. It is a communication facility in that it can report developments, both favourable and unfavourable, to managers and in that it can keep the managers posted and informed. Above all, PERT is an outstanding approach to achieving completion of projects on time."⁵⁰

?
only for a
new
project?
Tell us
more

CPM is a variation of PERT and concentrates on those activities in a project which must be completed on time (e.g. which are "critical") if the whole project is to be finished on schedule. PERT/CPM and the many modifications the techniques have gone through do not solve managers' problems in an automatic way. They are merely tools that should render the manager's planning and control more effective. Levin and Kirkpatrick point this out very clearly:

50 - R.I. Levin and C.A. Kirkpatrick, Planning and Control with PERT/CPM, McGraw Hill, New York, 1966, p. 5.

"One brief word of caution: neither PERT nor any other management technique solves managers' problems. Instead, they help a manager realize what his problems are, what solutions are realistic, and hopefully, the strengths and weaknesses of each. PERT tries to keep managers informed of all factors and considerations that bear on their decisions. Although PERT is no substitute for managerial intelligence and perceptivity, experience and judgment, it can be a most worthwhile aid and tool in decision-making."⁵¹

We have noted that PERT/CPM is a technique that can be used in both planning and control. The theory of planning has been examined previously; let us now turn to the concept of control. Control is a process (that is, a continuous function) which involves (1) establishing standards, (2) measuring performance against these standards, and (3) correcting deviations from standards and plans. Control is based upon the concept of feedback which concept is basic to the operation of any system be it a production system or otherwise. Chart VI illustrates this concept of feedback.

51 - ibid., p. 6 No attempt is made in this chapter to analyze or describe the actual mechanics of these techniques; this has been thoroughly covered in the literature. An excellent reference remains that of Levin and Kirkpatrick, op. cit., see also: H.F. Evarts, Introduction to PERT, Boston, Allyn and Bacon, 1964; K.G. Lockyer, Critical Path Analysis, London, Sir Isaac Pitman, 1966; R.D. Archibald and R.L. Villoria, Network-Based Management Systems (PERT/CPM) New York, John Wiley, 1967. For an interesting case study of the use of PERT/CPM in a governmental environment see: A.J. Catanese and A.W. Steiss, "Programming for Governmental Operations: the Critical Path Approach", Public Administration Review, March-April, 1968.

CHART VISimple Feedback-A Cybernetic System

INPUT

OUTPUT

Input can take the form of manpower, money, or plans. Some kind of process will be undertaken which should modify inputs in order to reach certain stated objectives (output); if there is a detection of any deviation from prescribed plans or desired objectives then the feedback loop goes into operation leading to a correction process, some type of corrective action and ultimately back to the process or operation for completion. A control system in program budgeting is established in order to maximize efficiency; this is indicated in the box control (efficiency) in Chart V. What is efficiency? In broad terms efficiency can be thought of as a series of ratios each of which is synonymous with one another; these are:

- (1) $\frac{\text{measure of production}}{\text{measure of resources}} = \text{measure of efficiency.}$

- (2) maximum production best efficiency
 given resources
- (3) benefits measure of efficiency
 costs
- (4) output measure of efficiency
 input

In other words when talking of efficiency we are really concerned with assuring that the best possible use (e.g. in economic terms) is made of given, limited resources. As we have seen previously this is the rationale behind the complete program budgeting system; it thus becomes critical that proposed control systems be very thoroughly analyzed before being implemented. If sound planning is essential sound control is just as important if not moreso.

The three steps in the control process should be elaborated on at this point. Standards must first of all be established; standards are established criteria against which actual results can be measured. Standards can be physical and represent quantities of products, units of service, man-hours, volume of acceptance or rejection, etc... Again standards may be expressed in monetary terms such as costs, revenues, or investments. Through simulation techniques a manager may even be able to predict in some cases where deviations from established standards may occur and take corrective action. Correction of deviations is the point at which control meshes with the other managerial functions especially planning. A manager, using information provided by the control system, may correct a situation by

redrawing his plan of action or modifying his goals or again by re-designing the organizational structure. This is one of the reasons why a technique such as PERT/CPM has a re-planning cycle or step built in. Another possible means of correcting or modifying a situation may be through additional staffing, better selection and training of subordinates or again stronger, more autocratic leadership. Thus we see that control is not an isolated process. In the last analysis a sophisticated control system should be set-up along the following lines:

CHART VII

Feedback Loop of Management Control

Having said all of the above on control we are still faced with the question: how efficient can government operations be?

Efficiency in government is a topic which has fostered many heated discussions. It can safely be said that most people generally do not equate efficiency with government operations. Mitchell Sharp put it rather succinctly when he said "...outside of Ottawa the view is widely held that the government service is less efficient than private business. The opinion of the ordinary taxpayer is that there are too many civil servants, that most of them lack initiative and enterprise and that Parkinson's Law prevails"⁵². This concept is an unfounded one; there is no empirical evidence available to document this case with any degree of certitude. Rather the concept is based on a misunderstanding of the term "efficiency" in a government context:

Efficiency tends to have a different meaning for business and for government. The purpose of a business enterprise is to make profits for its owners. Efficiency therefore tends to be equated with profitability. In government, on the other hand, efficiency is measured wholly in terms of economy of operation. There are jobs to be done and government can, if it will, concentrate upon performing these jobs efficiently and at minimum cost⁵³.

Government efficiency is therefore "providing an acceptable service with the least expenditure of time, materials, and money. The criteria is therefore the amount and quality of service rendered in relation; this is the measure of efficiency"⁵⁴.

Efficiency & effectiveness

52 - M.W. Sharp, "Measurement of Efficiency in Government and Business", Canadian Public Administration, June, 1960, p. 150.

53 - ibid., p. 152-153.

54 - G.N.M. Currie, "Efficiency VS Service in Public Administration", Canadian Public Administration, June, 1964, p. 166. See also: H.R. Balls, "Efficient Public Administration", Canadian Public Administration, June 1964.

Once decisions have been taken to undertake certain programs at the Cabinet level and these decisions transformed into concrete projects efficiency must be a prime consideration. If the carrying out of a given project shows itself to be inefficient then it will have to go back to the drawing boards, that is back to the implementation stage as shown in Chart V (on page 54). The role of management information systems in this context will be analyzed in Chapter IV.

The key to the concept of efficiency is of course a sound set of standards. This will prove to be a somewhat difficult achievement especially in areas of intangibles. Program budgeting attempts to define such standards through the use of sophisticated management techniques. The establishing of standards will undoubtedly prove to one of the major obstacles in the implementation of program budgeting; yet it is an obstacle that must be surmounted for the rationale of the system is based upon it. ⁵⁵ Much progress has been made along these lines; moreover as the system becomes operational and expands to include the whole of government activity the control process will become refined and newer techniques being developed in the course of implementation should provide us with better standards of

55 - See: H. Koontz and C. O'Donnell, Principles of Management, New York, McGraw-Hill, 1968, especially Chapter 29, "Newer Control Techniques"; for further elaboration on the nature and requirements of sound controls see Chapter 28, "The Process of Control".

performance. One organizational change introduced by Treasury Board⁵⁶ which should be of great value to managers in striving for maximum efficiency is that of management or operational auditing. An operational audit may be defined as "a systematic independent appraisal activity within an organization for a review of the entire departmental operations, as a service to management"⁵⁷. In other words auditing has shifted its focus from a purely financial review (e.g. the verification of assets, liabilities, revenues, and expenses) to a review and appraisal of an organization's (e.g. in our case a department, division or section) complete operations. This fits in with the modern concept of control (that is control not for the sake of control but rather to help management assess and improve performance). The role of the operational auditor becomes one of "furnishing management with objective analyses, appraisals, recommendations and pertinent comments concerning the activities reviewed"⁵⁸. Most of the Departments are now in the process of setting up or have already established operational audit groups which will operate as a departmental function reporting to top management. This is another step forward which should render the term control

56 - Treasury Board, Management Improvement Policy Number Mi-3-66, 654193, April 28, 1966.

57 - G. Peter Wilson, "Operational Auditing in the Canadian Federal Public Service", Local Government Finance, April, 1968, p. 130. See also: Financial Management Guide, op. cit., p. 40 et sq.

58 - ibid., p. 132.

CHART VIIIThe Various Phases of the Management AuditA- EXAMINATION

AREAS FOR REVIEW

1. One or more specific functions
2. Department or group of departments
3. Division or group of
4. The entire business

DETAILS FOR STUDY

1. Plans and objectives
2. Organizational structure
3. Policies, systems, and procedures
4. Methods of control
5. Human and physical facilities
6. Standards for performance
7. Measurement of results

B- EVALUATION AND APPRAISAL

PROCESS FOR EVALUATION
FACTORS FOR APPRAISAL

1. Economic outlook
2. Adequacy of organization structure
3. Compliance with policies and procedures
4. Accuracy and reliability of controls
5. Adequate protective methods
6. Causes for variances
7. Proper utilization of manpower
8. Satisfactory methods of operation

SCIENTIFIC ANALYSIS
INTERPRETATION AND SYNTHESIS

1. Study the elements
2. Detailed diagnosis
3. Determine purpose and relationship
4. Look for deficiencies
5. Analytical balance
6. Test for effectiveness
7. Search for problems
8. Ascertain solutions
9. Determine alternatives
10. Seek out methods for improvement

C- PRESENTATION

ORAL
DISCUSSION
OF
IMPORTANT
ITEMS

WRITTEN
REPORT OF
FINDINGS
AND
RECOMMENDATIONS

FINAL
REPORT
TO
MANAGEMENT

D- FOLLOW-UP

CHECK
ON
INSTALLA-
TIONS

AID IN
THE DESIGN
OF FORMS
AND PRO-
CEDURES

COMPLETE
ANY UNFI-
NISHED
MATTERS

REVIEW
REPORT
WITH TOP
MANAGEMENT

more meaningful in government operations⁵⁹.

The last point we need to cover in this chapter is that of evaluation for purposes of determining the effectiveness of programs as shown in bottom box on the lower left hand side of Chart V (page 54). Effectiveness and efficiency are not identical concepts; efficiency, as we have seen, is concerned with output in relation to input with the ultimate aim of maximizing output for a given level of input; effectiveness is primarily concerned with determining whether a job is being done or a given task accomplished or not. A project can be highly efficient and yet fail to be effective; on the other hand a project may be highly effective but very inefficient (that is, very costly to maintain). Obviously some projects will be both effective and efficient. A department must insure to the greatest extent possible that the two areas of efficiency and effectiveness are present. The loop "as far back as possible" in Chart V indicated that if this is not so projects and programs will have to be re-evaluated again or perhaps even abandoned. This stage is therefore seen as a crucial one for it is in determining effectiveness that the rationale of given projects or programs will be borne out or revised. ✓

59 - For a complete assessment of this new approach to auditing see: W. Leonard, Management Audit, Englewood Cliffs, Prentice Hall, 1968; H.F. Stettler, Systems Based Independent Audits, Englewood Cliffs, Prentice Hall, 1967.

Let us now look at the management techniques inherent in a program budgeting system: systems analysis, operations research, cost-benefit analysis and management information systems.

CHAPTER IV

The Techniques of Program Budgeting

Administration today has become a job for specialists; it is no longer sufficient to rely simply on flair or force of personality or on a good honours degree, helpful though these may be in themselves. Nowadays, the administrator-like any other technician - will expect to practice his calling making full use of the specialized administrative techniques available to him.⁶⁰

The above quotation states rather bluntly the fact that administration, both in the public as well as in the private sector, is rapidly changing: management is invariably linked with sophisticated new techniques and methods which were undreamed of twenty years ago. Automation has wrought a revolution in management thought and practice, a revolution which is still but gathering steam. Administrators must therefore, if they are to survive much less prosper, understand the new techniques of management science and, more important perhaps, be able to utilize them effectively. This does not imply that administrators must become experts in these techniques which is a job for the functional specialists; it simply implies that an administrator should be aware of the techniques available, their limitations and uses. The techniques are just that: tools and not replacements

60 - S. MacRae and S. Page, Tools for Administrators in the Public Service, London, Edward Arnold Publishers Ltd., 1967, P. V, (underlining mine).

for management. Even in a fully operational program budgeting system decisions will still have to be made in the final analysis by individual managers; the techniques available should, in the long run, render these decisions more meaningful and effective. It is with this view in mind that the Planning Programming Budgeting Guide was published as evidenced below:

Much of the guide is, therefore, devoted to describing the techniques and the analytic processes in which they are used. Because the analytic processes can be quite complex, the chapters describing them have had to be made quite technical in their content. However, since it is managers and not analysts to whom the guide is addressed, this guide is not a "how to" manual. In addition, it would be unfortunate if the emphasis necessarily given to techniques of analysis were to create the impression that analysis is being presented here as a substitute for managerial judgment and that the application of the techniques leads automatically to the "right" decision. In a PPB System, analysis is expected only to promote better decisions since analysis is likely to bring forward a greater range of alternative courses of action for consideration by management and to make more apparent the probable effects of each course of action.⁶¹

This Chapter will analyze the nature of the new techniques and their uses. An attempt is made to integrate this into a theoretical context by looking at the theory of decision-making. We shall focus our attention on four major areas: the concept of systems and systems analysis; the theory and

61 - Planning, Programming, Budgeting Guide, p. iii.

techniques of management decision-making; cost-benefit analysis; and management information systems.

The nature of systems and systems analysis

Before we look at the techniques of systems analysis we must define our terms. First of all, what is a system? A system is an interconnected set of components which operate together to carry out a related set of activities, each activity being directed toward a desired goal which is the production of goods, services, or information. The nature of a system is best shown through a graphic presentation. An organization, any organization for that matter, can be seen as a system⁶². Chart IX gives a simple presentation of this concept⁶³:

CHART IX

A BASIC SYSTEM

*how do we
know what the
goal of a
complex system
is?*

62 - This tendency to view organizations as systems is a new one in management thought and was brought forth by the "modern organization theory" school of management which attempts to integrate some of the elements of both the classical and neo-classical (e.g. human relations) schools; for a thorough discussion of the principles underlying the modern organization theory approach see: W.G. Scott, "Organization Theory: An Overview and an Appraisal", in M.S. Wadia, ed., The Nature and Scope of Management, Chicago, Scott, Foresman, 1966. See also K.E. Boulding, "General Systems Theory: The Skeleton of a Science", in P.P. Schoderbek, ed., Management Systems, New York, John Wiley, 1967.

63 - See M.D. Richards and P.S. Greenlaw, Management Decision-Making, Homewood, Richard D. Irwin, Inc.

There must be an input, something must be done to transform this input and bring about, as a result, an output. The organization can be a business corporation, a government or a hospital; the basic presentation is still valid. However, Chart IX does not give a complete picture of a system for it does not show the element which is most important for any system, that of feedback (See Chart VI, page 58). Using as an analogy the structure of a computer system Chart X presents a more complete description of a system:

A system, therefore, requires: an input, a processor, an output, a feedback loop and some form of control mechanism (as was seen in Chapter III). Finally if we expand on Chart XI we obtain a more thorough breakdown of the five elements noted⁶⁴.

⁶⁴ - A complete analysis is given in M.D. Richards and P.S. Greenlaw, op. cit., p. 77 et sq.

CHART XIDetailed Breakdown of the Elements of a System

Given the general nature of a system as described above we can then ask the question: "what is systems analysis?" The Planning Programming Budgeting Guide defines the term in its broadest meaning: "The term systems analysis is taken in this guide to include the whole analytic process of clarifying objectives, the defining of appropriate program-activity structures for the achievement of objectives and in particular cost-benefit analysis"⁶⁵. The crux of systems analysis then involves the critical analysis of a given system (whether the organization as a whole, e.g. the total system, or any of the sub-systems) with the view of determining whether the system under study is rational and

65 - Planning, Programming, Budgeting Guide, p. 4.

is accomplishing the aims or goals it is meant to accomplish⁶⁶. Within a total system all sub-systems tend to be interdependent. An example will bear out this statement: a decision to hire 10 additional workers will have an effect not only upon an organization's personnel system but also on the financial system because these men must be paid. Let us suppose that these men join the production line then the organization's production system will be affected and so on. The same analogy can be utilized when we go down to smaller units. A systems analysis can be made of the paper flow in a given office or section; whatever is happening in this function will invariably affect the other functions involved. The following section will look at some of the techniques involved in systems analysis integrating the various techniques into the theory of decision-making.

The theory and the techniques of decision-making⁶⁷

At each step in the planning process previously described some decisions will have to be taken. This brings out the first important point: decision-making is not planning. Planning is a wider or broader concept that encompasses decision-making. Murdick shows this very clearly when he states "If

66 - For a review of the concepts of systems analysis see: S.L. Optmer, Systems Analysis for Business Management, Englewood Cliffs, Prentice Hall, 1968; V. Lazzaro, ed., Systems and Procedures, Englewood Cliffs, Prentice Hall, 1968.

67 - The initial research for this section on decision-making was undertaken under the direction of the late Professor A. Willms whose invaluable help the author wishes to acknowledge.

planning consists of creating alternative courses of action for the future, then we conclude that decision-making is an evaluation and selection process which terminates a phase of planning and eventually the complete planning process"⁶⁸. Yet this is not to say that planning is more important; sound planning and sound decision-making will complement one another. Decision-making lies at the heart of the managerial process. Whatever else the successful manager may be he is first and foremost a specialist in decision-making. Drucker in "The Practice of Management" stresses the fact that "management is a decision-making process"⁶⁹. Simon points out that the "task of decision pervades the entire administrative organization quite as much as does the task of doing"⁷⁰. Other writers on management agree as to the importance of decision-making for the manager; Krupp in his "Pattern in Organization Analysis" states it in these terms:

"The process of administration is identified with decision-making and involves the selection of alternative strategies, the tracing of probable consequences of these alternatives, and the evaluation of these consequences in terms of the preconceived values or goals"⁷¹.

This last statement underscores the fact that decision-making is not an isolated task that can be divorced from the process of

68 - R.G. Murdick, "Nature of Planning and Plans", Advanced Management Journal, October, 1965, p. 37.

69 - P. Drucker, The Practice of Management, New York, Harper & Brothers, 1954, p. 381.

70 - H.A. Simon, Administrative Behaviour, New York, The Free Press, 1957, p. 1.

71 - S. Krupp, Pattern in Organization Analysis, New York, Holt, Rinehart, & Winston, 1961. p. 93.

management; rather, decision-making is a function that cannot be explained by any pat formula. Its primary characteristic is the presence of uncertainty. Nevertheless this does not imply that effective decision-making is a haphazard process. This section attempts to examine how the manager through the use of new techniques such as operations research and simulation can better cope with this constraint of uncertainty thereby improving his decision-making function and ultimately the effectiveness of his planning.

The decision-making process

Before we attempt to delve into the area of techniques we must first of all look at the decision-making process as a whole. Decision-making, according to Drucker, has five distinct phases:⁷²

- 1) defining the problem
- 2) analyzing the problem
- 3) developing alternate solutions
- 4) deciding upon the best solution
- 5) converting the decision into effective action

Prior to finding a solution to a certain problem or situation we must logically define the problem as we see it.

72 - Drucker, op. cit., p. 353.

This is not decision-making; it involves determining the "critical factor", that is, the element (or elements) in the situation that has to be changed before anything else can be changed, moved, or acted upon. The second step in defining the problem is to determine the conditions for its solution; this involves stating clearly the organization's objectives and rules. One of the rules may be that company policy limits borrowing to one half of its capital requirements or that no outside hiring is done for new positions until all the managers within the organization have been considered. Once the problem has been delineated the next phase involves analyzing the problem: classifying it and finding the facts.

An analysis of the problem is necessary in order to determine where the ultimate responsibility for making the decision lies; moreover this phase should attempt to identify who should be consulted in making the decision as well as who must be informed. Most decisions taken within an organization will in one way or another affect the other constituent parts of the organization; this strengthens the need for the manager to take over-all view of the decision before him. Once the above-mentioned steps have been taken then the manager is confronted with the task of obtaining and sifting through the facts. Based on the available data the manager must define and classify which data are relevant and dismiss the irrelevant facts. It should be pointed out that a manager will seldom obtain all the facts he

should have; the elements of uncertainty and time can never be eliminated from the decision-making process.

The manager, once he has analyzed the problem, should turn his mind to developing alternative solutions. There normally exist a series of possible solutions to a given problem; this will include the possibility of not taking any action. The manager's task in this phase lies in determining what all the alternative solutions are in order to arrive at the "best" possible solution. This represents the fourth phase in decision-making and the one phase in which management can most effectively use the new mathematical tools and techniques. In choosing the best solution a manager must consider four criteria.

Decision tree

- a) the risk (do the expected benefits justify the risk involved?)
- b) economy of effort (which solution will give the greatest results with minimum effort?)
- c) timing (the urgency of the problem)
- d) limitation of available resources

Finally, the decision must be made effective in action⁷³. The managerial decision is rendered effective through the action of other people. This implies that subordinates must partici-

73 - See: P. Drucker, "The Effective Decision", Harvard Business Review, Jan.-Feb. 1967, pp. 92-98.

pate to a certain extent in that decision; Drucker points out that such participation should take place not in the information-gathering phase of the decision-making process but rather in the stage of developing alternatives, choosing a possible solution and applying it. In this final phase also the concept of feedback is important for a decision once taken must be tested continuously through reports, controls and observation; as Drucker states in his article "even the most effective decision eventually becomes obsolete"⁷⁴.

Having thus looked at the decision-making process as a whole we now turn to the different kinds or classifications of decisions that a manager has to cope with. This will serve to place in perspective those areas that lend themselves better to scientific decision-making techniques. Basically there are two categories of decisions; Herbert Simon, one of the pioneers in decision theory, considers decisions to be represented by a continuum the extremes of which are programmed decisions and non-programmed decisions⁷⁵. A programmed decision is repetitive and routine to the extent that a definite procedure has been worked out for handling it. A non-programmed decision is one that is novel, unstructured, and consequential. From this one

74 - ibid., p. 97.

75 - See his The New Science of Management Decision, New York, Harper & Brothers, 1960, p. 5. This has been expanded in his The Shape of Automation for Men and Management, New York, Harper and Row, 1967.

*programmed decision requires
clear statement of what system is
trying to optimize*

78

can say that a non-programmed decision can become a programmed decision if a definite procedure is worked out for handling it. As a corollary every programmed decision was once an unprogrammed decision. The various steps in the decision-making process will vary in importance according to the type of decision we are dealing with; also, the availability of mathematical techniques will depend on whether we have a programmed or a non-programmed decision.

Programmed Decision-Making

We first start off by defining a "program". Simon sees a program as "a detailed prescription or strategy that governs the sequence of response of a system to a complex task environment"⁷⁶. Of the five steps of the decision-making process previously described we note that two are of a greater importance in programmed decisions: determination of possible or alternative strategies and the actual choice of a specific strategy. There are a number of traditional techniques that have been developed for programmed decision-making. These may be categorized as:

- 1) habit - internally programmed decisions
- 2) clerical routine - standard operating procedures

76 - The Shape of Automation for Men and Management, p. 61; (the term "program" in this context is not given the same meaning as in the PPBS terminology).

TABLE 5Simon's decision-making continuum⁷⁷

TYPES OF DECISIONS		DECISION-MAKING TECHNIQUES	
		Traditional	Modern
Programmed:			
Routine, repetitive decisions	1. Habit	1. Operations Research: Mathematical analysis Models	
Organization develops specific processes for handling them	2. Clerical routine: Standard operating procedures	2. Electronic data processing	
	3. Organization structure: Common expectations A system of subgoals Well-defined informational channels		
Non-programmed:			
One-shot, ill-structured novel policy decisions	1. Judgment, intuition, and creativity	Heuristic problem-solving technique applied to:	
Handled by general problem- solving processes	2. Rules of thumb	(a) training human decision makers	
	3. Selection and training of executives	(b) constructing heuristic computer programs	

77 - Simon, The Shape of Automation for Men and Management, p. 64.

3) organization structure - this consists of

- a) common expectations
- b) a system of subgoals
- c) well-defined information channels

These are techniques which have been well known and used in the past by managers to improve the decision-making process; this has been done by improving the knowledge, skills and habits of employees through management training programs and job rotation, the development of better standard operating procedures and finally by modifying the structure of the organization where needed through reorganization and re-allocation of responsibilities.

Our attention must focus on those newer tools or methods that are available in programmed decisions. These consist of

- 1 - operations research
 - a) mathematical analysis
 - b) models
 - c) computer simulation
- 2 - electronic data processing

This classification (Simon's) is somewhat arbitrary and can be modified; we would place together under the operations research

78 - For a recent review of the use of EDP and computers in government operations see: G.Y. Cornog et al., EDP Systems in Public Management, Chicago, Rand McNally, 1968; also, H.H. Fitch, The Computer Challenge to Urban Planners and State Administrators, New York, Spartan Books, 1968.

label mathematical analysis, models and EDP which are constituent elements of any operations research approach as we shall see. Simulation differs from OR and as such should be treated separately.

Operations research (OR) is a much-used term in management circles but also a much misunderstood term. OR is not a technique but rather a combination of techniques. It has been defined as "...the study of administrative systems pursued in the same scientific manner in which systems in physics, chemistry and biology are studied in the natural sciences"⁷⁹. From this it may be implied that the major features that characterize OR are:

- . It approaches the problem in as broad and thorough a way as possible.
- . It makes use of scientific principles and techniques to analyze the problem objectively.
- . It provides a range of alternative solutions to the problem, evaluating each of them, and pointing out the 'best' solution under the assumptions of the study.

In solving complex problems, no set of instructions can explain exactly how to start, what steps to follow, and how to reach sound conclusions. But there are basic procedures whose application helps to provide sound and objective solutions. These

79 - E. Duckworth, A Guide to Operational Research, London, Methuen, 1965, p. 8.

procedures rely on the methods common to all scientific investigations. The systematic use of the methods and techniques of science - in approach, in analysis, and in the determination of a 'best' solution - is what particularly distinguishes OR from other methods of problem solving. There are several steps to be followed in any OR study; each step will utilize one or more techniques depending on the nature of the problem.

Step I involves the formulation of the study which in turn implies a) developing a precise formulation of the problem and of the objectives of the study and b) making an investigation of the operation under study. In this step, OR often draws upon the techniques associated with mathematical statistics to: a) determine the kinds of information needed to obtain an understanding of the problem and operation under study; b) obtain necessary special information at a reasonable cost, and with control of its reliability. Sampling techniques, for example, are used to collect information efficiently. Experimental design is often used in determining the relative importance of factors and their interactions. Multivariate analysis may be useful for developing measureable relationships between factors. Probability theory may be useful because of the need to express mathematically the elements of change or risk which enter into many business and management problems. In this step there is usually a need also for the more familiar statistical techniques such as those measuring averages, dispersion, and correlation.

Step II is the setting up of a "model"⁸⁰, that is, a mathematical or functional presentation of the problem we are faced with. To formulate a model of an operation requires the determination of the underlying pattern or 'structure' of the operation and the significant factors involved. Many operations have basic similarities in their underlying patterns. These similarities have made it possible to group OR models into a few major classifications.

The more important classes of models are: allocation models, waiting-line models (sometimes called congestion models), inventory models, replacement models, and sequencing models. Let us look at these models separately.

Allocation models

Allocation models are associated with problems in which there are a number of activities to be performed with limited resources and there are alternative ways of handling these activities. The problem is to allocate the available resources (funds, machines, personnel, etc.) to the alternative ways of performing the activities (while satisfying all the restrictions imposed) in such a way that the total cost is minimized or the total profit maximized (or some other objective or set of objectives is best satisfied).

80 - The nature of models is further dealt with in our section on cost-benefit analysis.

EXAMPLE: Consider the assignment of jobs to machines, where each job may be processed on any one of the machines. Suppose we have four jobs and four machines. Assuming information to be available on the costs associated with assigning each of the jobs to each machine, the problem is to make the assignments in such a way that total costs will be as low as possible. In this case, there would be twenty-four possible solutions and we would want to determine which one is best.

Waiting-line Models

Waiting-line models are associated with the problem of determining the level of service facilities and the pattern of servicing in a way which will minimize the sum of the costs associated with waiting time and service facilities, including the costs of keeping people waiting and losses because people leave and do not return.

EXAMPLE: Automobiles arrive in varying numbers at a toll collection point on an expressway. The number arriving during any given period of time depends upon the time of day, the season, and many other factors. How many toll facilities and toll collectors should be provided?

Inventory Models

To operate effectively, most business and governmental concerns must carry inventories of different kinds - supplies, equipment, products, etc. - and in different quantities, the type and quantity depending upon the nature of operations of the concern. The level of inventories carried is a matter of management control and involves decisions as to (1) how much to purchase or

produce and (2) when and how often to do so.

EXAMPLE: A firm manufacturing small household electrical appliances has had a 20% increase in their inventory of these appliances during the past year. The president of the firm wants to know whether the present high level of inventory, and the large amount of money tied up in it, is justifiable or not.

Replacement Models

Replacement problems occur in situations where plant or equipment wears out, becomes outmoded, or fails, and so has to be restored or replaced. Usually the problem is to determine at what time such remedial action should be taken in order to minimize the associated costs.

EXAMPLE: A generator in an electrical power plant was built and installed fifteen years ago. It requires more maintenance than formerly but is still operating fairly well. Generators of greater efficiency are now available but at considerably greater initial cost. Should the old generator be replaced now, or when?

Sequencing Models

In this class problem the purpose is to find the sequence or order of processing or servicing a number of units - supplies, jobs, items of equipment, etc. - which will minimize the cost. This is done by determining the answer to either or both - depending on the nature of the problem - of two basic questions: in which order should the units be processed or serviced?; in what order should a series of service operations be performed?

EXAMPLE: Given are three jobs to be performed, each requiring time on each of four machines. The problem is to determine in what sequence or order the jobs should be done on the different machines so as to minimize the total time required. Assuming no restrictions in the order in which the operations can be performed, there would be a large number of different sequences that would be possible.

In three of these major classes of models - allocation, waiting-line, inventory - extensive experience has provided a number of 'standard' patterns. Although replacement models have not as yet been developed on such a broad basis, much useful work has been done with them. Only a relatively few practical sequencing models are available, but a large amount of work is being done in this area. In total, this considerable store of background knowledge is an invaluable aid in designing and constructing a basic model to represent an individual operation under study.

There are other classes of OR models that are not covered here: for example, 'competitive game' models. For most of these, methods of solution have been developed for only the simpler problems. But much work is being done to formulate and solve more complex models⁸¹.

81 - For a full treatment of this area see: F.A. Lindsay, New Techniques for Management Decision Making, McGraw-Hill, New York, 1965.

Step III covers the application of mathematical techniques to the model to derive and evaluate optimum solutions. Optimum solutions may be obtained by applying analytical techniques to the model, using such branches of mathematics as calculus or matrix theory. Or, the solution may require the use of 'numerical' procedures which narrow down possible solutions until an optimum solution or an adequate approximation to it is reached.

The selection of the particular mathematical techniques to be used in deriving the 'best' solution from the model depends on the class and the characteristics of the model.

Some important points about the development of models and techniques to solve them, for the five major classifications of models are outlined below:

- . for solving Allocation problems, there has been developed a group of specialized techniques called Mathematical Programming. One of these techniques, which is widely used and often mentioned in OR literature, is known as 'Linear' Programming.
- . For solving Waiting-line problems and Inventory problems, a large number of different models have been developed to take care of a variety of conditions. For Waiting-line problems, the body of information about models and the techniques used to solve them is collectively called Queueing Theory. For Inventory problems, the body of

- . information about models and techniques of solution is called Inventory Theory.
- . The mathematical reasoning underlying Replacement models has had a special attraction for mathematicians, statisticians, economists, and actuaries, with the result that there are now available a number of models, each designed to solve a replacement problem based on a particular set of assumptions. These models and the techniques for their solution are collectively referred to as Replacement Theory.
- . Many practical Sequencing problems present more formidable difficulties than can be handled by techniques now available. Since this class of problem is an important one, a great deal of work is being done to develop Sequencing Theory techniques. It is hoped that this work will lead to the solution of more complex problems⁸².

Mathematical techniques are used also in carrying out the fourth step - testing solutions. Here, some of the techniques used in the earlier steps may be required again. For example, sampling may be used to obtain additional input data needed for

82 - Those interested in the actual mathematical techniques will find a good coverage in Howell and Teichroew; Mathematical Analysis for Business Decisions, R.D. Irwin, Inc., Homewood Illinois, 1965.

carrying out these tests. In some cases, however, entirely different techniques may be necessary for carrying out this step. For example, it may be appropriate to use such techniques as statistical decision theory, tests of hypotheses, etc.

Simulation

The technique of simulation has greater applicability than operations research to semi-programmed decision-making. Simulation is a very recently developed method of observing the dynamic behaviour of a system. A computer is programmed with a mathematical model of a system and the response of the model to external stimuli is observed. The object is to learn from the reaction of the mathematical model what the reaction of the actual system will be.

Simulation differs from operations research in several ways. Operations research has the object of optimizing a particular function. Simulation is a means of determining the response of a system to stimuli, including interactions between components and external stimuli. Feedback, through a thermostat, from a heating system to the air temperature is a common example of such interreaction. The procedures involved in the two techniques also differ. Operations research requires the numerical solution of equations whereas simulation does not.

Simulation is subject to the same basic requirements as

operations research, since they are both built on mathematical bases.

Contribution of the new techniques to programmed decision-making can be considered in two classes. The direct contribution is the achievement of greater optimization of programmed decision-making. The indirect contribution is the fresh outlook brought to the scene by the various scientists who have become involved in programmed decision-making. This outlook has resulted in the reappraisal of many operating procedures previously accepted without question in the process of management. Whether or not such a reappraisal results in abandoning or keeping the procedures involved is immaterial. The basic point is that they have been critically examined. The major impact of new programmed decision-making techniques will probably be felt at middle management levels. In the past those in the middle levels of management have devoted the majority of their efforts to programmed decision-making. Application of the new techniques should free more time for the intelligence phase of decision-making. This may take the form of a greater effort to determine what criteria actually affect the performance of the particular unit of responsibility. Results of such non-programmed decisions can then be used to improve programmed decision-making. If such an evaluation occurs, middle management will be upgraded with respect to the type of work performed.

*appraisal of programmed decisions is one of
appraising the dec rule, not the manager*

Non-programmed decision-making

A decision is non-programmed to the extent that it is novel, unstructured, and consequential. In other words there is no "cookbook" method one can use when faced with such a situation, no specific, concrete technique that can be applied such as mathematical programming. Until recently very little effort had been devoted to the study of non-programmed decision-making. In the past we have relied on non-scientific explanations of the non-programmed decision-making process such as "the exercise of good judgment" which in itself is based upon experience, insight, and intuition. This type of explanation is quite often inadequate in today's dynamic managerial environment. Simon states it in these terms:

We have not had, in the past, adequate knowledge of the processes that are involved in decision-making in complex situations. Human thinking, problem solving, and learning have been mysterious processes which we have labeled but not explained. Lacking an understanding of these processes, we have had to resort to gross techniques for improving non-programmed decision-making: selection of men who have demonstrated their capacity for it; further development of their powers through professional training and planned experience; protection of non-programmed activity from the pressure of repetitive activity by establishing specialized organizational units to carry it on⁸³.

New techniques and research in non-programmed decision-making

Improvements in non-programmed decision-making may

83 - Simon, The Shape of Automation for Men and Management, p. 67.

be ascribed to two major causes; 1) improvements that flow as a result of improvements in programmed decision-making, 2) improved research in the psychological aspects of decision-making and learning processes.

Improvements resulting from changes in programmed decision-making are largely indirect. EDP has had the effect of making information both more complete and more accessible to decision makers. This removes part of the communication limitation on non-programmed decision-making but it does not tell the decision maker what is pertinent and what is not. The application of such techniques as operations research and simulation to programmed decision-making has had a significant effect on non-programmed decision-making. For example, the application of OR to a problem such as determining optimum inventory levels requires conscious weighing by management of consequences of alternative policies. Almost invariably this results in the re-examination of one or more basic policies. Simulation has had an even greater effect on non-programmed decision-making. Like OR, its use usually results in a critical re-examination of goals and policies. Of greater importance, however, is the fact that simulation provides a direct source of information as to the probable effect of a particular strategy on the organization because of the feedback aspect of the technique.

Improvements resulting from research into decision

theory and learning processes are treated by Simon under the heading "heuristic problem solving"⁸⁴. This involves two areas: 1) use of heuristic techniques in the training of decision makers and 2) the construction of heuristic computer programs that replace the decision maker almost totally. Heuristic techniques may be used in management training where an attempt is made to simulate actual management conditions and thus apply the learning process to decision-making in an environment where mistakes are not costly. One example of this is the use of business games. Most business games are based on zero-sum game theory. This means that any loss by one competitor directly accrues to another, the total remaining constant. Business games have exhibited one very valuable characteristic in actual use; they demonstrate forcefully to the participants the limitations on future activities imposed by present decisions.⁸⁵

The most striking advances in heuristic problem-solving have been made in the area of computer programs that simulate human thinking. This is based on the following fact, according

84 - The term heuristic program is not defined by Simon. It is generally used to refer to programs that are constructed to approximate human thought processes (e.g. based upon certain basic laws of logic). These computer-based programs are then utilized to solve problems both of a structured and unstructured type.

85 - See: C.H. Kepner and B.B. Tregoe, "Developing Decision Makers", Harvard Business Review, Sept.-Oct. 1960, p. 116.

to Simon: since human thinking, in solving problems, is governed by programs that organize myriads of simple information processes (or symbol manipulation processes) into orderly, complex sequences that are responsive to and adaptive to the task environment and the clues that are extracted from that environment as the sequences unfold, it becomes possible to write computer programs that function in an exact manner. This means that, with the present state of computer science, it has now become possible to write programs that describe human symbol manipulation which programs are in turn utilized to simulate human thought processes. Human problem solving proceeds by erecting goals, detecting differences between present situation and goals, locating in memory or by search tools or processes that are relevant, and applying these tools or processes. Each problem generates sub-problems until we find a sub-problem we can solve - for which we already have a program stored in memory. We proceed, until by successive solution of such sub-problems we eventually achieve our overall goal, or give up. The computer can now be programmed to do the exact same thing. The research in this field has led to the development of a "general problem-solving program" as well as other problem-solving and learning programs⁸⁶. Although the advances up to now have been

86 - It is not necessary for our purpose to discuss these programs to any great length - See Simon, The Shape of Automation for Men and Management, pp. 83-89.

quite limited such developments, if they continue to occur with the rapidity of the past few years, should thoroughly revolutionize the decision-making process. Cost is now the prohibitive factor in this area but as computer design and programming evolve the economics of heuristic problem-solving by computers will change rapidly.

We have analyzed the decision-making process in order to point out those areas where the manager can utilize the newer techniques in order to improve his decision-making. It is rather difficult to reach specific conclusions within the scope of this chapter. Nevertheless there are two major conclusions which may be drawn from the material presented.

- 1) the present "revolution" in management science is bound to continue and accelerate in the future.
- 2) regardless of the formidable advances made in developing new techniques the manager will not be superseded.

Undoubtedly the advances in management science in the post-war period have been prodigious; most writers in the field are of the opinion that this tendency will accelerate in the future. This augurs well for management as a whole to improve its performance and free individual managers from routine tasks in order that they may concentrate on problems of policy, innovation, and change. It

also implies that management training both formal and on the job must be tailored to these new techniques; management education must abandon its descriptive approach and adopt a scientific, analytical framework. This applies even more so in the public sector where management development and techniques have tended to lag behind the private sector. Public administrators who handle budgets that involve billions of dollars must utilize the most effective techniques available. Since Glassco and the introduction of program budgeting we have attempted to adopt such an approach in Canadian government; it cannot fail to bear fruit.

Notwithstanding everything we have said concerning the advantages of the new techniques they will never replace the manager, indeed they must never be permitted to replace the manager. They are at best "tools" that can be utilized to improve management's performance. As with any other "man-centred" science complete quantification and scientific abstraction become virtually impossible because of the human element. To the extent that managers learn to use the new techniques, within given limitations, managerial effectiveness will be greatly improved.

Lastly let us now turn to an analysis of cost-benefit analysis, the most important of the techniques of program budgeting.

Cost-benefit analysis⁸⁷

What is cost-benefit analysis? It may be defined as

a technique available to help management improve its planning and decision-making functions by systematically relating the costs of a proposed expenditure to the benefits derived from that expenditure over an extended period of time⁸⁸. This concept is illustrated in chart XII.

CHART XII

THE COST-BENEFIT PRINCIPLE

87 - In the literature the terms benefit-cost, cost-utility and cost-effectiveness analysis are quite often utilized; unless otherwise noted this study will accept these terms as equivalent to the term cost-benefit analysis which appears to be the most widely accepted term.

88 - The first major review of the literature of cost-benefit analysis was published as recently as 1965; see: A.R. Prest and R. Turvey, "Cost-Benefit Analysis: A Survey", The Economic Journal, December, 1965; for an earlier treatment in Canada see W.R.D. Sewell, Guide to Benefit-Cost Analysis, Ottawa, Queen's Printer, 1962.

In allocating funds for any project the ideal principle would be to increase expenditures to that point where the benefit of the last dollar spent is greater than or at least equal to the dollar of cost. In chart XII the horizontal axis represents total costs in dollars while the vertical axis represents marginal costs and benefits in dollars. Because quantity is measured by dollars spent the marginal cost curve is just a line parallel to the base equal to 1.0 (the marginal cost of an extra dollar of spending is a dollar). According to the principle enunciated above we would push expenditures up to the point where $MB = MC$. This is perhaps better illustrated with a numerical example. The example chosen refers to the design of a flood control project (which incidentally, is an area where cost-benefit analysis has been utilized most extensively). The problem we are faced with is that of choosing which flood control project is best (e.g. which gives us the most protection at the least cost.) Table 6 gives us hypothetical figures on which we can base our decision.

TABLE 6

COST-BENEFIT ANALYSIS OF ALTERNATIVE FLOOD CONTROL PROJECTS

Plan	Annual Cost of project	Average Annual Damage	Benefit (Reduction of Damage)
Without protection	0	\$38,000	0
Plan A - levees	\$ 3,000	32,000	\$ 6,000
Plan B - small reservoir	10,000	22,000	16,000
Plan C - medium reservoir	18,000	13,000	25,000
Plan D - large reservoir	30,000	6,000	32,000

TABLE 6 (cont'd)

Plan	Marginal Benefit	Marginal Cost
No plan	0	0
Plan A	\$ 6,000	\$ 3,000
Plan B	10,000	7,000
Plan C	9,000	8,000
Plan D	7,000	12,000

In the example Plan C, the medium sized reservoir, is the best plan. Its cost exceeds that of the small reservoir by \$8,000 yet it prevents an additional \$9,000 of damages; in other words marginal benefits exceed marginal costs. It would not be feasible to adopt Plan D, the large reservoir, for extra benefits of \$7,000 would in effect cost \$12,000, a situation where marginal costs greatly exceed marginal benefits.

The above example is without a doubt a very simplified and straight forward one⁸⁹. We must now qualify our analysis by saying that cost-benefit analysis is but a tool to help management; it does not "automatically" provide us with the "correct" decision.

89 - The example does not introduce the concepts of discounting and present versus future costs and benefits; this rather technical subject area is treated at length in the Planning, Programming, Budgeting Guide, pp. 12-14 and in Appendix D, pp. 49-55.

There are inherent limitations built into the technique itself. Perhaps the most important one centres on the fact that the dollar yardstick cannot be applied to the benefits of many of the areas of government activity. We are then faced with the problem of assessing the benefits of intangibles, a very difficult process (the services provided by the Department of External Affairs comes to mind). Even in spheres of activity where it is easier to provide figures in dollars and cents (flood control, highways, electric power production) precise techniques of measurement and evaluation are still in the process of being worked out. The greatest use of the technique at the present time is to be found in areas where benefits are primarily economic, tangible and measurable. Any administrator who, when attempting to utilize cost-benefit analysis, ignores the limitations, is bound to fail in his task. Any systems advisor or expert who fails to consider the limitations in his recommendations to management is not fulfilling his role properly.

Yet there are great advantages to the cost-benefit approach. One leading expert in public finance has summarized the basic advantages in a way which bears repeating:

Nonetheless, the cost-benefit principle is of great importance. At the very least, it is a useful antidote to two approaches that are widely employed and that are pretty sure to lead to poor results. The first of these is the requirements approach. It says that a country "needs" X thousand more new housing units, W million gallons of water, Y dozen

nuclear submarines, Z thousand more classrooms by 1975, and that this need is so clear that it must be fulfilled regardless of the cost. In fact, there is always some cost which that "requirement" is not worth. And adding up the "requirement" as seen by the proponents of each program always yields fantastically expensive results. Economic resources are scarce; tough choices have to be made between competing programs, and strongly voiced assertions about requirements and needs do not really help us to reach wise decisions. Benefits must be balanced against costs at the margin.

The other fallacious approach is the what we can afford or budget first approach. It determines the total to be spent before looking at the benefits. While usually employed by opponents of spending who suggest that an extra dollar beyond the arbitrarily set amount would somehow bankrupt the country, the approach also has a spender's variant: "Why are we spending only X per cent of our GNP on - fill in your favorite government service - when we spend Y per cent on liquor and tobacco?"

A firm grasp of the benefit-cost principle will not provide easy answers to expenditure choices. Instead it forces us to pass judgment on the worth of the expenditure at issue, to see if it is worth its tax cost, and whether it represents the best use of the public money. It also focuses the attention of decision-makers on the margins, where the decisions are made. It does not ask: "Is defense worth its cost?" but rather, "Would an extra billion of defense yield an important enough improvement in our strength to be worth the cost?" This is the sort of inescapable question which the president and Congress have to face every year, and which they have to answer⁹⁰. even where precise measurement of benefit is impossible.

As a conclusion we could say that the great value lies

90 - Otto Eckstein, Public Finance, Englewood Cliffs, Prentice Hall, 1967, p. 28.

not solely in the technique itself but more so in the method of analysis. The method of cost-benefit analysis involves five steps:

- a) determine the objectives: what are the various objectives that a given policy wishes to accomplish
- b) determine the alternatives: for any set of objectives there will be alternative ways of attaining them
- c) determine the costs and benefits: for each alternative a series of figures showing the various costs and benefits can be established
- d) structure a model: a model approximates reality, as was seen previously, and is useful in assessing various alternatives
- e) determine your criterion or criteria: before making a decision the decision-maker has to set out a criterion (or criteria) which is then utilized to rank alternatives in order of preference⁹¹.

Thus it can be seen that such an approach forces an organization, any organization be it the Government as a whole, a Government

91 - The actual mechanics of this approach are outlined in E.S. Quade, "Cost-Effectiveness: An Outline and Overview", Rand Corporation Paper Number P-3134, June 14, 1965.

department or division or again, a non-government organization to reassess its spending programme by relating costs and benefits and also by stating very clearly what its objectives are which, at times, remains a very difficult thing to do. As we pointed out in our discussion of other techniques such an approach cannot fail to bear fruit and improve managerial effectiveness.

The use of the techniques described in this chapter presupposes the establishment of greatly improved management information systems than are presently in use in Government administration. The Treasury Board PPBS Guide points out clearly that

Probably all departments and agencies as they set out to implement PPB will find they are faced with a lack of information at every turn. They will almost certainly have insufficient data from which to derive estimates of the costs and benefits of alternatives they will want to analyze. The quality of planning and analysis must, therefore, if for no other reason, fall short of a high level of attainment... The full returns from the PPB system can only be enjoyed after there has been put in operation an information system which provides data to support analysis and control⁹².

The complexity and scope of this area precludes any discussion in this study but we can still conclude that departments, if they are to implement PPBS successfully will have to radically alter the information flows within their structures. Much research

92 - Planning, Programming, Budgeting Guide, p. 22.

remains to be done in this field⁹³.

-
- 93 - Some of the most recent relevant literature on management information systems includes: P. Schoderbek, ed., Management Systems, A Book of Readings, New York, John Wiley and Sons, 1967; H.H. Elwell, "Data and Information Management System", Management Services, Nov.-Dec. 1967; H.S. Gellman, "Improving Management Information Systems", Cost and Management, September, 1968; R. Beyer, "A Positive Look at Management Information Systems", Financial Executive, June, 1968; R. Rhind, "Management Information Systems", Business Horizons, June, 1968. There is very little literature available on the use of management information systems in a governmental context.

why
not
attempt
to apply
yourself

CHAPTER V

PROBLEMS OF IMPLEMENTATION AND A CASE STUDY

Any administrative system as radical and far sweeping as program budgeting is bound to create massive problems at all stages of implementation. It is simply impossible to anticipate the numerous problems and resistance that will be encountered in a complete change-over from a system of administration which is primarily input-oriented to one which is primarily output-oriented. Traditional methods of doing things do not yield easily to change and innovation in any organization. Moreover there is an acute lack of previous information upon which to base our attempts in Canada. Some attempts have been made at cataloguing the problems encountered in implementing PPBS in the United States. Millward divides the difficulties of PPBS into two major categories: conceptual and operational with further distinctions being made as to short range and long range problems⁹³. By conceptual problems he refers to the problems encountered in designing the program budget and relating it to decision-making requirements; this will include the fundamental role and nature of the functions of management, the kinds of problems that require governmental action and the processing of the endless data needed in decision-making. There are two major problems encountered in this respect: first, the determination of objectives which creates

93 - See R.E. Millward, "PPBS: Problems of Implementation", Journal of the American Institute of Planners, March, 1968.

a tremendous problem in itself. As the author points out "societal goals are rather elusive. Ends are rarely agreed upon among individuals, agencies, or in government as a whole, and they possess dynamic properties....Certainly objectives are seldom articulated, even with the expenditures of vast sums of money"⁹⁴. Relating means to ends creates the second problem for "even if we had specific goals that were agreed upon, the knowledge of effective means to achieve them is overwhelmingly inadequate"⁹⁵. The techniques outlined in Chapter 4, as sophisticated as they may seem are really in an embryonic stage and much work remains to be done to enhance their effectiveness.

Operational problems are also created. Given fairly precise broad objectives it still is difficult to relate objectives to specific programs. The program-activity breakdown must be as meaningful as possible and avoid duplication and overlap. This, of course, will probably only come from a trial and error process and the experience of the operating units. Another problem encountered is relating specific programs to resource requirements and the resource inputs to budget dollars. This is where cost-benefit analysis can play an important role although as noted previously, there are rather severe restrictions built into the technique especially with regard to the quantifying of certain benefits in so-called intangible areas. There might also be

94 - ibid., p. 91.

95 - ibid.

problems created by the resistance of management and certain agencies which might tend to lose a certain portion of their sphere of activity. This is where the time lag comes in. As Millward put it:

It is natural for agencies and individuals to fear any kind of a shift that might involve decisions less advantageous to their interests. McKean and Anshen suggest three possible outcomes of the new system: (1) identification and possible removal of overlapping and redundant activities; (2) exposure of ineffective or inefficient employment of resources; and (3) clearer illumination of the long-range cost implications of proposals with relatively painless initial expenses and consequent better screening of such proposals with an accompanying higher rejection rate. What they are saying shows that the promise to provide better information that is better organized for better decision-making is not always universally received. The goals of government are not necessarily consistent with those of its individual components, nor with individual administrators. The structure of decision-making arising from PPBS most likely will not resemble the existing bureaucracy. Since the resulting realignment and reorganization of agency functions and programs will also produce a subsequent shakeup of hierarchical relationships, it is easy to see why PPBS initially will not be endorsed wholeheartedly. The decision-making structure will no doubt adjust to process in the long run, with a corresponding adjustment of process to structure, but potential PPBS users should be warned of the time lag before it will be fully operative.⁹⁶

There is also a corollary problem created due to the fact that public administrators do not have the experience necessary in developing, evaluating, and using extended-term cost estimates. This demands that extensive efforts be made on educational programs designed to provide the background knowledge necessary to an understanding of PPBS.

96 - ibid., p. 92.

The experience of the Government of Canada in program budgeting has not been extensive yet the problems encountered in the first year by the seven departments which were selected to initially implement the system closely approximate the problems enunciated by Millward. These problems are outlined below as they were set out in a Treasury Board Memorandum⁹⁷.

The Problems of Program Budgeting:

While the rewards of a successfully operated program budgeting system are great, it should not be forgotten that establishing a system is a difficult task. Implementation involves not merely re-writing estimates in a new form, but completely re-appraising both planning and financial management functions within departments. Throughout the implementation exercise a number of obstacles will be encountered. These include:

- a. Definition of policy objectives.
- b. Determination of meaningful performance indicators.
- c. Provision and analysis of a cost-effectiveness relationship that is meaningful in terms of the socio-political objectives of the program.
- d. Finding feasible alternative methods of satisfying these objectives.
- e. Organizational problems in combining, in an effective working unit, the responsibilities for the planning of physical resources and financial management.
- f. Determination of the relationship between the responsibility centre and the program and the activity.
- g. Overcoming the reluctance to disclose feasible alternative levels of program or activity to the Treasury Board and to senior departmental management.

Results of the First Year of Program Review:

The Federal Government is committed to the concept of program budgeting, and all departments will be gradually converted to the new system. The results of the first year are promising, but the following observations are sufficiently

97 - Treasury Board memorandum dated May 25, 1967

characteristic of departmental problems to be noted:

a. Involvement of top management

The involvement of top management was marginal, even with respect to the process of defining the structure of programs and activities. This has meant that the initiative for program budgeting has rested in the hands of middle management. A full and decisive commitment by top management is essential if the success of program budgeting is to be assured.

b. Difficulty in program identification

Departments found difficulty in identification of program structure and their specific objectives in a meaningful way.

c. Tendency to consider program budgeting a purely financial matter

Traditionally, the initiative for introducing the new concepts for financial management which led to program budgeting rested with the financial administrators. However, without the involvement of top line managers, there is a serious danger that program budgeting will be considered merely as a system of financial control, which it clearly is not. On the contrary, program budgeting has a dual function of serving both to allocate resources and to control expenditures.

d. Lack of emphasis on analysis

In program budgeting, "planning" is to a large extent the analysis and evaluation of alternative means of satisfying a given set of policy objectives. Unfortunately, the lack of the necessary human resources and an understatement of the importance of the planning function adversely affected last year's program review.

e. A passive approach to long-range forecasting

In most cases, the forecasts provided were straightforward projections of what had happened in the previous year, with some conventional percentage growth factors added. The critical examination of the validity of using the previous year's performance as a basis of future action is the first step in program analysis. Automatic acceptance of last year's operations will not provide a valid base for planning.

f. Lack of performance indicators

With certain notable exceptions, no performance indicators were provided last year. As a result, appraisal of departmental performance was intuitive rather than based on facts.

g. Confusion between "responsibility centre" and "activity"

While the "responsibility centre" and the "activity" may often be one and the same thing, it is usually the case that the responsibility centres will be called upon to manage elements of several parallel activities.

h. Weakness of communications

At the level of both senior departmental management and the Treasury Board, an apparent lack of communication resulted in misinterpretation of the purpose and meaning of program budgeting. Furthermore, in some cases departmental headquarters did not convey the purpose of the system to the field level adequately.

A Case Study - The Department of Indian
Affairs and Northern Development⁹⁸

The initial step we must look at is the establishment of the Department's program-activity structure⁹⁹. For purposes of program budgeting the Department's work was divided into four programs: administration program, Indian program, northern program, conservation program. As well the Department is responsible for the National Battlefields Commission, Northern Canada Power

98 - This section is not meant to be an exhaustive study of the Department; its main purposes is to attempt to show the progress that has been made in implementing program budgeting in a department. The fact that the Department is now in the final stages of a massive re-organization further complicates the task and should be borne in mind in assessing the success or failure of the implementation to this date.

99 - See Appendix II for a detailed breakdown of programs, activities, and sub-activities.

Commission and Northern Transportation Company Limited. The objectives of the various programs are listed below.

A - Department

Administration Program

This Program incorporates statutory provision for the Minister's salary and motor car allowance. Also provided is the immediate staff of the Minister, the Deputy and Assistant Deputy Ministers and their respective staffs and for administration expenses of central advisory services in the fields of finance, personnel, information, communication and materiel management.

Indian Program

The fundamental objective of the Indian Program is to assist Indian people to achieve their aspirations for physical and social equality within the Canadian society. This basic objective is pursued through activities in the fields of education, economic and community development, and social welfare.

Northern Program

The objectives of this program are to encourage and foster increased participation by the territories in their own affairs at the territorial and municipal levels; to develop the resources of the North for the present and future benefit of Canada; and, to provide educational, welfare, economic development and other services and programs for territorial residents generally, with particular attention to the special needs of the indigenous people in the Territories and Eskimos in Arctic Quebec.

Conservation Program

The objectives of this program are the preservation of nationally significant areas of the country in their natural environment and their management and development for the benefit and use of the present and future generations of Canada; the preservation, restoration and commemoration of sites and structures of national historical importance, and the preservation and wise use of wildlife resources.

B - National Battlefields Commission

The National Battlefields Commission was created in 1908 to manage and control the nation's historical battlefields at Québec.

C - Northern Canada Power Commission

The Commission's objectives are the construction and management of public utilities and distribution systems on a commercial basis in the Northwest Territories and Yukon Territory as well as northern Ontario and British Columbia.

D - Northern Transportation Company Limited

The objective of the Company is the provision of a general transportation system for the movement of people and goods by land and water in the Mackenzie Basin and the Central and Western Arctic area.

Let us now look at the Northern Program in more detail¹⁰⁰.

The objectives of the Northern Program are as follows:

- (a) to develop the Yukon and Northwest Territories as important components of the nation, contributing to the national economy and well-being, and offering investment and employment opportunities to Canadians;
- (b) to foster the development of effective local government in both territories at the territorial and municipal levels, and in particular to develop the capacity of the Government of the Northwest Territories to administer territorial programs and services hitherto provided through the Department;
- (c) to enable the people of the Yukon and Northwest Territories to advance socially and economically to the enjoyment of all rights, privileges and responsibilities of Canadians elsewhere, and to assist them in the achievement of the same standard of living and mobility as other Canadians;
- (d) to initiate and implement economic policies and programs designed to stimulate and accelerate the development of the natural resources of the Yukon and Northwest Territories;

100 - There are slight variations between the narrative of objectives and activities presented here and Appendix II. This is due to the re-organization of the Department as previously noted.

- (e) to safeguard the special rights and encourage the cultural expression of the indigenous people of the north and the Eskimos of Arctic Quebec through programs undertaken directly by the Department or through acceptable programs operated by the territorial governments in the Northwest Territories and Yukon Territory or by the provincial government in Arctic Quebec.
- (f) to assist the Eskimo people of Arctic Quebec to advance to the enjoyment of all the rights, privileges and responsibilities of other provincial residents.

Once the program's objectives are outlined the narrative then proceeds down to the activity level¹⁰¹. The program consists of six activities as follows:

Administration - northern Administration Branch includes Central Branch management, personnel and engineering services at Branch Headquarters; also costs associated with the operation of the District, Regional, and Area Offices.

Education - all education services including Schools, Hostels, Adult Education and vocational training in the Northwest Territories, Northern Quebec and Churchill, Manitoba, and directly related administrative expenses at Ottawa Headquarters, District and Regional Offices.

Regional Development - includes four major sub-activities:

- Small Business Development - To develop an economic climate for the material and sociological advancement of Eskimos and Indians in northern Canada. This is achieved by originating field projects, providing training in the skills and management required and eventually developing co-operatives whereby the individuals concerned can achieve a fair standard of living based on self-dependency.
- Welfare - Services designed to resolve or alleviate a wide range of human problems. This includes a child welfare service, a program of rehabilitation designed to return chronic hospital cases to useful employment and a social assistance program which serves to prevent starvation and physical debilitation.
- Surface Resources - Management of the forests and surface lands of the Yukon and Northwest Territories.
- Northern Housing - Costs at Headquarters and in the field associated with the administration of the Housing Program for Indians and Eskimos in the Northwest Territories.

101 - The preceeding narrative of programs, objectives and activities is extracted from documents provided to the Author by senior Departmental managers.

Territorial Governments - offices of the Commissioner of the Yukon and of the Northwest Territories and municipal services to the public in the north where the Department is the only supplier, also grants under the Federal-Territorial Financial Agreements.

In addition provision is made for loans to the Government of the Yukon Territory for mortgage loans and townsite development.

Northern Co-ordination and Research - Co-ordination of all federal government activities in the north and the fostering of northern science and technology. It is divided into three sub-activities as follows:

Northern Co-ordination - covers the provision of the secretariat for the Advisory Committee on Northern Development and its sub-committees, which is the principal means of achieving co-ordination of federal government activities in the north. It also includes certain departmental staff functions involving other departments, and the processing within the department of matters involving military and external affairs.

Northern Research - is concerned with fostering northern science and technology. It involves the encouragement of northern scientific research by providing facilities and financial support and by other means, and the conduct of a program of northern research with emphasis in the social sciences, together with the administration of a grants-in-aid program for northern research, the maintenance of liaison with northern scientists in Canada and abroad, and the collection and dissemination of northern scientific and technical information.

Administration - covers the direction and administrative support for the activity, the editing, printing, and distribution of reports, the handling of all personnel matters, and the processing of applications for northern scientific licenses.

Resource and Economic Development - this Activity consists of the following sub-activities:

Administration - includes central management, financial and personnel management, and support services.

Economic Development - originates, develops and implements policies, programs, and special projects designed to accelerate the economic development of the Yukon and Northwest Territories; it also provides an economic advisory capability for other Branches of the Department.

Resource Management - originates, develops, and implements policies, programs and procedures designed to stimulate and accelerate optimum resource development in the Yukon and Northwest Territories.

Roads and Airstrips - (Northwest Territories and Yukon) includes construction and maintenance of roads under the northern roads program and administration of the Resource Airstrips Contributions.

Three separate organizations are involved in this program: The Northern Administration Branch, the Resource and Economic Development Branch and the Northern Co-ordination and Research Centre.

What has been described up to now can be referred to as phase one of implementation that is, the setting up of the Department's work on the basis of programs, activities, and sub-activities. This initial phase is an extremely important one although it must be stated emphatically that this does not constitute a program budgeting system per se.

The Department is now just getting underway on what we could term the second phase, that is the utilization of the techniques described in this study in order to optimize the program-activity structure and measure its efficiency and effectiveness. Appendix III shows the program that is presently underway in the Department in this respect; attempts are being made to develop, design and implement a statistical program which will provide the basis for planning and for relating achievements to plans for the entire Department. This means that present information systems will also have to be completely changed and computerized which change is presently underway.¹⁰²

102 - The forms now in use in the reporting systems are included for purposes of illustration at the end of the appendix section. These forms are provided to top management on a monthly basis and are accompanied by a narrative explaining any variance encountered during the reporting period.

No attempt can obviously be made at this stage to assess the success or failure of the system within the Department until at least two or three years of experience have been accumulated. We can however briefly discuss the initial problems of implementation that the Department has faced¹⁰³. One of the major problems encountered was in defining objectives; it is felt, however that the task was less difficult at the program level than at the activity level. The lack of a definite, stated government policy in the areas of activity encompassed by the Department obviously made this problem a very difficult one to deal with. Also at the activity level there was some difficulty in defining activities properly and assigning managerial responsibility for given activities. This lead to a re-organization of the Department which re-organization is still not complete. The increased delegation of authority was difficult to cope with because of the lack of definite objectives and system of post-audit to ensure that managers are meeting goals. The management audit group was established as a result to overcome this latter problem.

Perhaps the biggest problem encountered, according to management, was in the area of manpower and personnel. As is to be expected the Department faced a serious shortage of sophisticated manpower, with an awareness of what the new system involves. This, of course, is a problem common to most, if not all, departments. The education of managers at all levels was therefore viewed as

103 - The following information was relayed to the author in discussions with senior Departmental managers.

a top priority item; subsequently the Department established fairly intensive training courses on the philosophy, objectives and practical problems of program budgeting. Also the office of the Financial and Management Adviser was created and serves as a coordinating body. The other problems were noted before and deal with the lack of sound data necessary to undertake cost-benefit analysis as well as physical performance standards that are still very crude. However some progress is being made as shown in Appendix III. Yet the road ahead is going to be a very bumpy one; as one manager noted "we still have a very long way to go on planning and measuring effectiveness". A task force was established with personnel from the Comptroller of the Treasury to look at the area of information systems. This area is being expanded rapidly. Finally we must comment on the attitudes of top management concerning program budgeting. As was noted previously if top management is not receptive to the idea then the system is bound to fail. This negative attitude was not found in the Department; on the contrary the managers interviewed were of the opinion that top management provided a stimulus to the introduction of program budgeting and was very much involved in its implementation. This will be of immense value in helping managers, both line and staff, to make positive contributions in overcoming the problems that will occur in the future.

Chapter VI

CONCLUSIONS

The bulk of this study has dealt with the theoretical aspects of program budgeting. This area has largely been up to this time the domain of economists and management specialists who have taken a very optimistic view of the new approach. Indeed this optimism permeates much of this study. Program budgeting can improve the present budgetary procedures in the Government of Canada which at best can be characterized as less than rational and in many instances quite irrational (e.g. in an economic sense). This is what the theory seems to suggest yet this optimism must now make way to some very well-founded pessimism which, however, does not invalidate our major conclusion. It appears through our perusal of the writings on P.P.B.S. (both in Canada and the United States) that the shortcomings or limitations of the system have been sadly neglected by most authors. Notable exceptions like Wildavsky have tried to show what these limitations are although in many cases this pessimism has been carried to an extreme as we shall see. Let us now look at these limitations and see how valid they appear to be and to what extent they can be minimized or overcome.

The major criticism levied against P.P.B.S. concerns rationality. Undoubtedly, rationality lies at the heart of the system. Many writers have made the argument that rationality is not a state of affairs that dominates government decision-making and real life; consequently any new system that is based on rationality simply ignores basic reality and is an impossibility.

The old concepts of Linblom's "muddling through" and incremental decision-making and budgeting still hold sway. Wildavsky's approach is based along these lines¹⁰⁴. Etzioni has gone one step further and rejected both rationalism and incremental strategy in decision-making, the former because it requires greater resources than decision-makers command and the latter because it neglects basic societal innovations; in their place he proposes a "mixed scanning"¹⁰⁵ approach which combines a limited analysis of details in fundamental decisions and overcomes incrementalism by exploring longer-run alternatives. There are some merits presented in these arguments yet they can be refuted, at least in part. If perfect or complete rationality were the aim of program budgeting then one would have to agree completely with the dissenters. Yet complete rationality in P.P.B.S. is not what is being advocated. Throughout our study we have emphasized the fact that the techniques of program budgeting do not given an "automatic" "correct" or "perfect" decision; this is not the basic premise of the system. What the techniques will accomplish, if utilized properly, is to narrow down the boundaries or areas of uncertainty that a manager faces in his decision-making, that is to cut down on those areas where rationality is an impossibility or at best very difficult to achieve. The techniques are but tools that can lead to "better" decisions

104 - See his The Politics of the Budgetary Process, Boston, Little Brown and Company, 1964.

105 - A. Etzioni, "Mixed-Scanning: A Third Approach to Decision-Making", Public Administration Review, December, 1967.

especially with refinements and improvements in the techniques that are continuously being made. The process of approaching decisions in a systematic way instead of "muddling through" can have beneficial effects in itself; P.P.B.S. attempts to improve decision-making, not render it perfect. Some amount of subjective evaluation is bound to creep into any decision and may even be beneficial in certain cases where a manager has years of experience in and a certain "feel" for an area of activity. P.P.B.S., contrary to what may appear on the surface, does not adopt that mechanistic a view of human behaviour nor attempt to do away with managerial creativity which is a very difficult thing to quantify under any circumstances.

The second contentious area involves that of political considerations. P.P.B.S. does not purport to eliminate decisions that are purely of a political nature. One has to admit that no budgetary system can accomplish this. Pressure and interest groups in a democratic society will always flourish both outside and within the bureaucracy. Yet the new form of Estimates that will be provided to Parliament will undoubtedly lead to a more effective criticism in committees such as the Public Accounts Committee and perhaps cut down on the number of purely political decisions by making them more obvious and blatant. By relating government actions to very specific and stated objectives P.P.B.S. works towards a reduction in the number of political decisions taken.

The two major limitations noted up to now are related mainly to the philosophy and concepts of program budgeting. There are other limitations of an operational nature some of

which have been discussed in the section on implementation. There are limits to the amount of analysis that can be carried out because of limited manpower resources and the extensive need for sophisticated reporting systems that is created. One may also ask whether the organization(s) in question will have the physical capacity to carry out sophisticated cost-benefit analysis almost continuously. Cybernetics and its applications have been viewed in a positive manner yet it is also true that communications problems and blockages may occur with computer systems with resultant dysfunctional consequences. In this same vein bad feedback may also have disastrous effects by closing out certain courses of action open to a decision-maker. The speed of computer systems might prevent this kind of mistake from being discovered or corrected in time to prevent serious harm. Finally, program budgeting will have a disruptive influence on the bureaucratic structure with effects that are difficult to predict. Only a thorough program of management education throughout the public service can help overcome this type of difficulty. In the long-run the success of program budgeting probably rests upon this last consideration.

The limitations are there and must be accepted as inevitable. Yet the pessimism exhibited by Wildavsky, for example, cannot be accepted by this author. Wildavsky has summarized his thoughts succinctly when he says¹⁰⁶:

In past writings I argued that program budgeting would run up against severe political difficulties. While most of these arguments have been conceded, I

106 - A. Wildavsky, "Rescuing Policy Analysis from P.P.B.S.", Public Administration Review, March-April, 1969, p.193.

have been told that in a better world, without the vulgar intrusion of political factors (such as the consent of the governed), PPBS would perform its wonders as advertised. Not it is clear that for the narrow purpose of predicting why program budgeting would not work there was no need to mention political problems at all. It would have been sufficient to say that the wholesale introduction of PPBS presented insuperable difficulties of calculation. All the obstacles previously mentioned, such as lack of talent, theory, and data, may be summed up in a single statement: no one knows how to do program budgeting. Another way of putting it would be to say that many know what program budgeting should be like in general, but no one knows what it should be in any particular case. Program budgeting cannot be stated in operational terms. There is no agreement on what the words mean, let alone an ability to show another person what should be done. The reason for the difficulty is that telling an agency to adopt program budgeting means telling it to find better policies and there is no formula for doing that. One can (and should) talk about measuring effectiveness, estimating costs, and comparing alternatives, but that is a far cry from being able to take the creative leap of formulating a better policy.

On the other hand no less an expert than Bertram Gross states:

"Nonetheless, there are constructive potentials of very great significance both in the concepts underlying PPB and in their application to real-life problems in many substantive areas"¹⁰⁷. Allen Schick provides the most apt quote on the question when he says¹⁰⁸,

The conceptual side of PPB presents something of a paradox. The important ideas are few in number and easy to understand. But they happen to run counter to the way American budgeting has been practiced for more than half a century. The concepts which took root in economics and planning will have to undergo considerable mutation before they can be successfully transplanted on political soil. PPB is an idea whose time has not quite come. It was introduced governmentwide before the requisite concepts, organizational capability, political conditions, informational resources, and techniques were adequately developed.

107 - B. Gross, "The New Systems Budgeting", ibid., p. 131.

108 - A. Schick, "Systems Politics and Systems Budgeting", ibid., p. 150, (underlining mine).

A decade ago, PPB was beyond reach; a decade or two hence, it, or some updated version, might be one of the conventions of budgeting. For the present, PPB must make do in a world it did not create and has not yet mastered.

Schick's approach is the one we would like to conclude with.

Program budgeting holds great promise for the future and is indeed forging a revolution in government management practices; however it will be a long time yet, perhaps even a generation or more, before a fully operational and effective program budgeting system is finally implemented.

Appendix IOverview of the Treasury Board Department

INDIAN AFFAIRS AND NORTHERN DEVELOPMENT
PROGRAM BREAKDOWN

<u>PROGRAM</u>	<u>ACTIVITY</u>	<u>Prior to Re-Organization October, 1968</u>
		<u>SUB-ACTIVITY</u>
	Office of the Minister	Minister Minister without Portfolio
	Office of the Deputy Minister	
	Departmental Secretariat	<u>Secretariat</u> Administration Library Northern Co-ordination Division
	Financial and Management Adviser	<u>Office of the Financial Management Adviser</u> Management Services Material Management Program Analysis and Management Accounting Computer Information Systems Central Statistics <u>Manpower Budgeting</u>
DEPARTMENTAL ADMINISTRATION	Personnel Adviser	<u>Administration</u> Classification and Pay Administration Planning and Staffing Staff Relations <u>Development and Training</u>
	Program Management Evaluation	
	Legal Adviser	
	Public Information Adviser	

PROGRAMACTIVITYSUB-ACTIVITY

Administration

Branch Administration

Administrative Services
for Indians

Policy and Planning

Federal Provincial Relations

Financial Services

Personnel

Development

GeneralResource and Industrial
Development

Engineering and Construction

Social Program

INDIAN

Education

General

Education in Federal
SchoolsEducation in Non-Federal
SchoolsTransportation and
Maintenance of Pupils

Adult Education

Vocational and Special
Training

Employment and Relocations

<u>PROGRAM</u>	<u>ACTIVITY</u>	<u>SUB-ACTIVITY</u>
NORTHERN	Administration	General
		Civil Service Housing
		<u>Engineering</u>
	Education	Elementary Schools
		Secondary/Vocational Schools
		Pupil Residences
		Adult Education
		Vocational Education
		<u>Eskimo Linguistics</u>
	Regional Development	Small Business Development
		Welfare
		Surface Resources
		<u>Northern Housing</u>
	Territorial Governments	Repair and Maintenance - Buildings
		Repair and Maintenance - Equipment
	Municipal Services	Fuel
		Power
		Water
		Sewage
		<u>Garbage</u>
	Resource and Economic Development	Administration
		Economic Staff Group
		Oil and Mineral
		Water, Forests and Land Development Analysis
		<u>Roads and Airstrips</u>
	Northern Science Research	Northern Scientific Adviser
		Policy, Planning and Programming
		Scientific Research Operations

PROGRAMACTIVITYSUB-ACTIVITY

Administration

Branch Directorate

Engineering and
Architectural

Finance and Management

Management Improvement

Personnel

National Parks

Planning

Maintenance and Works

Interpretations

Resource Conservations

Visitor Services

Administration

Townsite ServicesNational and Historic
Sites and Parks

Interpretations

Administration

Engineering - Restoration
and Maintenance

Visitor Service

Historical Research

National Architectural
Inventory

Archaeology

Resource Conservations

Historic Sites and
Monuments Board

CONSERVATION

Canadian Wildlife Service

Administration

Migratory Birds

Wildlife Research

Pesticides

Pathology

Limnology

Information

Interpretations

Appendix III

A STATISTICAL PROGRAM

FOR THE DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT

Purpose and Scope of the Program

The purpose of the program is to develop, design and implement a statistical program which will provide the basis for planning, and for relating achievements to plans, for the entire Department.

Objectives of the Program

The objectives of the program are to create a comprehensive statistical data inventory which will:

1. Accommodate the development of policies and plans.
2. Facilitate the consideration of alternatives during planning and execution.
3. Measure program effectiveness.
4. Measure operational efficiency.
5. Meet the data requirements of internal and external agencies and provide other supplementary data as required.

The existing systems, i.e., personnel, financial management, manpower budgeting, equipment cost and utilization, together with the statistical data inventory, will provide a fully integrated information system.

The program emphasis will be on orientation towards specific objectives, as stated by Branches rather than on needs for statistical data as anticipated by the Statistical Division.

Data Classification

For the purposes of classification, the data required by Departmental management may be categorized into four major groups:

1. Human
2. Natural
3. Physical
4. Financial

All of the data to be collected on behalf of the Department can be channelled into one of the major data categories, which in turn may be further divided into sub-categories, for example as follows:

1. Human - vital statistics, education, employment ability, occupations, recreation, status

2. Natural - agriculture, forestry, fisheries, minerals, game, wild crops
3. Physical - schools, hospitals, businesses, industries, farms, machinery, roads, utilities
4. Financial - (non-government only)
capital revenue, operating revenue, commercial activities, grants and subsidies, interest

Total System Concept

To provide management with balanced data, information from more than one category must usually be consolidated to give the complete picture of a particular situation. For example, the proposed development of a new industry might require information on population, labour availability, educational standards, roads and access. In addition, it might be necessary to relate the potential of the industry to the national economic picture, the current and future market demands and the local economic scene. To achieve a total system approach, information will therefore be drawn from all four major data categories, which derive their data from various sources such as our own Department, provincial government agencies, other federal government departments and private agencies. It is expected that much of this information will be computerized to speed the flow and to reduce the clerical work load. Wherever possible, such data will be fed directly into a central information source and then processed for transmission to the various levels of the Department from the operating field units to the Deputy Minister level, providing each level with information tailored to its needs.

Data Storage and Retrieval

The many sources of information will be catalogued and maintained in a master statistical data source index in the Central Statistics Division. Data itself will be stored in a central location by a method determined to be most suitable for the particular type of information, whether it be in conventional files, on computer tape or on microfilm. The data will be retired and disposed of when no longer needed according to the requirements of the originating branches.

Data Presentation

The collected data, once compiled and (when necessary) analysed, will be distributed to the Department in three major forms:

1. Regular reports, monthly, quarterly and annually.
2. Ad hoc reports.
3. On request for any statistical information stored in the data bank.

Impact of the Program

The major impact of the program will be to make available to operating units an appropriate combination of professional statistical knowledge which can be focused on any Departmental activity. These resources can be concentrated according to demand and priority to provide information which is accurate, meaningful, comprehensive and timely.

Overall Approach to New System

At present the data requirements of the Department are:

1. Being met by research-oriented groups and the data may or may not need refinement of approach.
2. Being partially met by established methods capable of integration with new and better methods.
3. Not being met because of vagueness of objectives, absence of standards, staff shortages, lack of system design, etc.

To establish the new system, it is intended to develop a framework which can be used as an infrastructure for the total statistical data system. At the present time the availability of data may be indicated by listing the four major categories in descending order: human, financial, physical, natural. Because of the ready availability of much of the required human resource data, it is proposed to begin implementation of the program by developing basic human resource information in the areas of education and vital statistics. Other data will then be integrated with the system, according to priorities to be established, until full coverage is obtained. The limited availability of specialist staff is a major factor in taking a selective approach at present.

Detailed Approach

To determine the human resource data requirements, the Central Statistics Division will conduct a series of meetings with the Education Divisions of the Department and all divisions having a direct interest in data relating to vital statistics.

The objectives of these meetings are:

1. To review statistical requirements in relation to set objectives.
2. To determine the existing information flow and to determine what, of the present flow, is needed and what can be disposed of.
3. To determine any new data required.

System development will then begin, in co-operation with the headquarters and field units concerned, to:

1. Combine the old and new information flows.
2. Develop an information flow system.
3. Set data priorities.
4. Develop collection, compilation and analysis procedures.
5. Determine manpower and material requirements.
6. Conduct thorough field testing.
7. Implement the system.

Determination of Priorities - The "Users" Committee

While the total statistical system is being developed, involving all four major categories, Departmental policies are likely to demand emphasis on specific resource areas. The setting of such priorities and of the overall Departmental Statistical Policy objectives must be the responsibility of a Departmental Users Committee, with referral to the Executive Committee where necessary.

Statistical Organization

To develop this Statistical Program, the Department has established a Central Statistics Division in the Office of the Financial and Management Adviser. The Division is headed by a Chief Statistician, and contains three sections with the following major responsibilities:

<u>Section</u>	<u>Major Responsibilities</u>
Analytical Services	Development analysis of the socio-economic aspects of: <ul style="list-style-type: none"> Education Community Development Welfare and Social Matters Cultural Affairs Resource Development Industrial Development Land Management Tourism and Recreation
Statistical Services	<ol style="list-style-type: none"> 1. General statistical design. 2. Integration and preparation of data for analysis. 3. Provision of technical support to analysts. Provision of statistical research advice. Operations evaluation.
Operations	<ol style="list-style-type: none"> 1. Operational design and testing of data systems. 2. Data flow control: <ol style="list-style-type: none"> a) Receiving b) Indexing and storage c) Retrieval d) Disposal

3. Publication and release of statistical data and reports.
4. Liaison and co-ordination with field operational units.
5. Field training of operational staff.
6. Statistical forms control and design.
7. Provision of administrative services.

Implementation

Implementation of the new program will begin early in September with initial concentration on education and vital statistics. The opening of the September 1969 school year was set as the target date for the introduction of the combined vital statistics and education data system as part of the human resource category.

Other resource data, that is those involving natural, physical and financial resources, will be fed into the system as the program is developed, starting with the classification of all data now available in the Department and adding additional information as required, depending upon priorities to be determined in conjunction with the Branches and the availability of specialist staff.

Some time will elapse before all Branch requirements are known and being served. Until that time, existing services must be maintained. Only with the utmost co-operation of all concerned can a system be built to serve today's needs and to phase out the requirements of yesterday without disrupting present services.

Department of Indian Affairs and Northern Development
Departmental Summary by Activity - Variance Report
 (in \$000)

PROGRAM/ACTIVITY	OPERATION AND MAINTENANCE			CAPITAL			GRANTS			TOTALS		
	VARIANCE FROM BUDGET			VARIANCE FROM BUDGET			VARIANCE FROM BUDGET			VARIANCE FROM BUDGET		
	MONTH	YEAR TO DATE	%	MONTH	YEAR TO DATE	%	MONTH	YEAR TO DATE	%	MONTH	YEAR TO DATE	%
	\$ AMOUNT	\$ AMOUNT	%	\$ AMOUNT	\$ AMOUNT	%	\$ AMOUNT	\$ AMOUNT	%	\$ AMOUNT	\$ AMOUNT	%
TOTAL - Depart'l. Admin.												
INDIAN PROGRAM												
General Administration												
Development												
Education												
TOTAL - Indian Program												
NORTHERN PROGRAM												
Administration - (Northern Admin.)												
Education												
Regional Development												
Territorial Governments												
Engineering & Municipal Servs.												
SUB-TOTAL - Northern Admin.												
Res. & Economic Development												
Northern Mineral Asst'ce, Grants												
SUB-TOTAL - Res. & Ec. Dev.												
Northern Co-ordination & Res.												
TOTAL - Northern Program												
CONSERVATION PROGRAM												
Administration												
National Parks												
Historic Sites												
SUB-TOTAL - Natl. & Hist. Parks												
Canadian Wildlife Service												
TOTAL - Conservation												
GRAND TOTAL												

Date Issued:

Issued by:

Distribution:

IAND 20-72 (4-67)

REVENUE REPORT

B

PROGRAM/ACTIVITY	FOR EXPLANATION OF CODES, PLEASE SEE REVERSE						PERIOD:	
	01	02	03	04	05	07/09	SUB-TOTAL	Revenue Year to date
	Tax Revenue	Return on Investment	Privileges, Licences & Fees	Proceeds From Sales	Services & Service Fees	Miscellaneous		
TOTAL - Departmental Administration								
INDIAN PROGRAM								
General Administration								
Development								
Education								
TOTAL - Indian Program								
NORTHERN PROGRAM								
Administration - (Northern Administration)								
Education								
Regional Development								
Territorial Governments								
Engineering & Municipal Services								
SUB-TOTAL - Northern Administration								
Resource & Economic Development								
SUB-TOTAL - Res. & Ec. Development								
Northern Co-ordination & Research								
TOTAL - Northern Program								
CONSERVATION PROGRAM								
Administration								
National Parks								
Historic Sites								
SUB-TOTAL - National & Historic Parks								
Canadian Wildlife Service								
TOTAL - Conservation								
GRAND TOTAL								

EXAMPLES OF THE TYPES OF REVENUE RECEIVED BY THE VARIOUS BRANCHES OR GROUPS

TYPES OF REVENUE	INDIAN AFFAIRS	NORTHERN ADMINISTRATION	RESOURCE & ECONOMIC DEV.	NATIONAL & HISTORIC PARKS	CANADIAN WILDLIFE SERV.
01. TAX REVENUE	N/A	Receipts from tax on furs exported out of the N.W.T.	N/A	N/A	N/A
02. RETURN ON INVESTMENT INTEREST EARNED ON LOANS AND PROFITS REALIZED FROM COMMERCIAL VENTURES FINANCED FROM APPROPRIATIONS.	Interest on Land and Timber purchased for Indians; Revolving Fund Loan to Indians; Housing Loans to Indians Sundries	Interest earned from Eskimo Loan Fund; Seed Grain Relief; Yukon and N.W.T. Govts. Sundries	Interest earned from Yukon Coal Co. & Mineral Loan Fund Sundries	Interest on Loans	N/A
03. PRIVILEGES, LICENCES & PERMITS ITEMS WHERE THE WHOLE OR PART OF THE COSTS OF THE SERVICE PERFORMED SHOULD BE BORNE BY THE PERSON TO WHOM IT IS PROVIDED	Receipts from Rentals Sundries - (Fees, Releases, Permits and Duplicate Enfranchisement)	Sale of Business Licences (General) Fishing Licences Timber Permits Rental of Land Buildings & Machinery, etc.	Receipts from Coal Leases Canada Mining Fees Oil and Gas Permits Fees, etc.	Sale of Fishing Licences Camping & Trailer Permits Bath house Fees Locker Rentals, etc.	Sale of Taxidermists' & Business Licences Migratory Game Bird Hunting Permits.
04. PROCEEDS FROM SALES RESULT OF SALES MADE FROM ACTIVITIES THAT HAVE AN END PRODUCT.	Proceeds from Sales Livestock Lumber and Fuel Wood Land and Buildings Sales - Chilcoten Forest School	Sale of Maps Kitchen Receipts Handicrafts, etc.	Sale of Maps Land Provinces Mineral Claim Sheets	Sale of Maps Game & Game Products Uniforms, etc.	N/A
05. SERVICE AND SERVICE FEES RECEIPTS FROM PROVISION OF A UTILITY SERVICE	Repayment of water, electricity & sewer costs, originally paid from appropriations. Equipment Rentals - charges for use of Crown owned road graders, trucks, tractors, etc.	Receipts from Custom Printing Utilities Barbershop, etc. Sundries	Receipts from Custom Printing Service	Receipts from Living Accommodation Water Rates Forest Telephones, etc.	N/A
06. REFUNDS FROM PREVIOUS YEAR'S EXPENDITURE REIMBURSEMENT OF IMPROPER EXPENDITURE, OR OVER EXPENDITURE MADE IN PREVIOUS FISCAL YEAR.	Reimbursement of Capital Costs - partial recovery of a capital expenditure made in a previous fiscal year - rarely occurs. Return of empty containers - oil drums, etc.	Refunds of Previous Year's Expenditure Sundries	Refunds of Previous Year's Expenditures	Refunds from Previous Year's Expenditures	Refunds from Previous Year's Expenditures
07. MISCELLANEOUS ITEMS NOT INCLUDED IN ABOVE	Receipts from Development - farm debts, (incl. seed) fish nets fur, etc.	Receipts from Damage to Govt. Property Premium Discount Exchange Recoverable Items Fines - Sundries	Oil & Gas Forfeitures Forfeiture of Security Deposits	Receipts from Provincial Motor Licences Miscellaneous Fines, etc.	Receipts from Fines under The Migratory Birds Convention Act

125—
120—
115—
110—
105—
100—
95—
90—
85—
80—
75—
70—
65—
60—
55—
50—
45—
40—
35—
30—
25—
20—
15—
10—
5—

APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
-------	-----	------	------	------	-------	------	------	------	------	------	------

DEPARTMENT OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT

PLANNED EXPENDITURES	ACTUAL EXPENDITURES
100	100

INDIAN PROGRAM SUMMARY

(\$ millions)

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130

TOTAL PROGRAM

TOTAL	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	TOTAL
PLANNED													
ACTUAL													

OPERATIONS AND MAINTAINANCE

TOTAL	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	TOTAL
PLANNED													
ACTUAL													

CAPITAL

TOTAL	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	TOTAL
PLANNED													
ACTUAL													

GRANTS

	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	TOTAL
PLANNED	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
ACTUAL	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

DEPARTMENT OF INDIAN AFFAIRS
AND NORTHERN DEVELOPMENT

INDIAN PROGRAM SUMMARY

(in \$000's)

LEGEND:

F.Y. = Previous year
Y.T.D. = Year to date
C.Y. = Current year
N.Y. = New year
() = Deficit funds

i. ND 10-106 (10-67) 7530-21-023-8305

CAPITAL BUDGET REPORT - PHYSICAL

BRANCH

PERIOD ENDING

PAGE . OF

40

[illegible]

IAN 10-106A (2-67)

DISTRIBUTION

ISSUED BY

DATE ISSUED

**Months
Physical, Financial, Commitments,
Planned & Y.T.D.**

H

MONTH

NARRATIVE:

IA ND 20-73 (5-67)

SUMMARY ACCOUNTS PAYABLE - ACCOUNTS RECEIVABLE

(Please See Reverse for nature of Accounts Receivable)

Accounts Receivable ☐
Accounts Payable ☐

PERIOD ENDING

PROGRAM/ACTIVITY	BALANCE OUTSTANDING \$ AMOUNT	AGED ANALYSIS				% TOTAL DEPT.
		CURRENT \$ AMOUNT	30-60 DAYS PAST DUE \$ AMOUNT	61-90 DAYS PAST DUE \$ AMOUNT	OVER 90 DAYS PAST DUE \$ AMOUNT	
Departmental Administration Program						
Indian Program						
Northern Program Northern Administration Resource & Economic Development						
Northern Coordination and Research						
Total - Northern Program						
Conservation Program National & Hist. Parks Br.						
Canadian Wildlife Service						
Total - Conservation Program						
GRAND TOTAL						

DATE ISSUED

ISSUED BY

DISTRIBUTION

BIBLIOGRAPHY

- 1 - Alesch, D.J., "Government in Evolution: A Real World Focus for State Planning", Public Administration Review, May-June, 1968.
- 2 - Archibald, R.D., and Villoria, R.L., Network-Based Management Systems (PERT/CPM), New York, John Wiley, 1967.
- 3 - Balls, H.R., "Efficient Public Administration", Canadian Public Administration, June, 1964.
- 4 - Benson, E.J., "Budget Breakthrough: Adoption of PPB", Canadian Tax Journal, May-June, 1968.
- 5 - Beyer, R., "A Positive Look at Management Information Systems", Financial Executive, June, 1968.
- 6 - Burkhead, J., Government Budgeting, New York, John Wiley and Sons, 1956.
- 7 - Catanese, A.J., and Steiss, A.W., "Programming for Governmental Operations: the Critical Path Approach", Public Administration Review, March-April, 1968.
- 8 - Commission on Organization of the Executive Branch of the Government, Budgeting and Accounting, Washington, 1949.
- 9 - Cornog, G.Y. et al., EDP Systems in Public Management, Chicago, Rand McNally, 1968.
- 10 - Currie, G.N.M., "Efficiency VS Service in Public Administration", Canadian Public Administration, June, 1964.
- 11 - David, P. and Reiner, T.A., "A Choice Theory of Planning", Journal of American Institute of Planners, May, 1962.
- 12 - Dror, Y., "The Planning Process: A Facet Design", International Review of Administrative Sciences, Vol. XXIX, 1963, No. 1.
- 13 - Drucker, P., The Practice of Management, New York, Harper and Brothers, 1954.
....., "The Effective Decision", Harvard Business Review, Jan.-Feb. 1967.
- 14 - Duckworth, E., A Guide to Operational Research, London, Methuen, 1965.
- 15 - Eckstein, O., Public Finance, Englewood Cliffs, Prentice Hall, 1967.
- 16 - Economic Council of Canada, Fourth Annual Review, Ottawa, Queen's Printer, 1967.

- 17 - Elwell, H.H., "Data and Information Management Systems", Management Services, Nov.-Dec. 1967.
- 18 - Etzioni, A., "Mixed-Scanning: A Third Approach to Decision-Making", Public Administration Review, December, 1967.
- 19 - Evarts, H.F. Introduction to PERT, Boston, Allyn and Bacon, 1964.
- 20 - Fitch, H.H., The Computer Challenge to Urban Planners and State Administrators, New York, Spartan Books, 1968.
- 21 - Gellman, H.S., "Improving Management Information Systems", Cost and Management, September, 1968.
- 22 - Gilmour, R.S., "A Planning-Programming-Budgeting System", Proceedings of the Conference of the Academy of Political Science, New York, January, 1967.
- 23 - Golembewski, R.T., editor, Public Budgeting and Finance, Itasca, Illinois, F.E. Peacock Publishers, 1968.
- 24 - Government of Canada, Royal Commission on Government Organization Vol. 1, Ottawa, Queen's Printer, 1963.
 , Program Review and Estimates Manual, Ottawa, Queen's Printer, 1967.
 , Financial Management in the Departments and Agencies of the Government of Canada, Ottawa, Queen's Printer, 1966.
 , Planning, Programming, Budgeting Guide, Ottawa, Queen's Printer, 1968.
- 25 - Gross, B., "MacNamara Management", Public Administration Review, Sept. 1965.
 , "The New Systems Budgeting", Public Administration Review, March-April, 1969.
- 26 - Hofstra, H.J., New Techniques of Budget Preparation and Management, Brussels, International Institute of Administrative Sciences, 1963.
- 27 - Howell, R., Mathematical Analysis for Business Decisions, Homewood, R.D. Irwin Inc., 1965.
- 28 - Kabir, A.K.M., "Performance Budgeting: Its Application in Pakistan", International Review of Administrative Sciences, Vol. 33 (1967), No. 4.
- 29 - Kaufman, W.W., The MacNamara Strategy, New York, Harper and Row, 1964.

- 30 - Kepner, C.H. and Tregoe, B.B., "Developing Decision Makers", Harvard Business Review, Sept.-Oct., 1960.
- 31 - Key, V.O., "The Lack of a Budgetary Theory", American Political Science Review, Vol. 34, December, 1940.
- 32 - Koontz, H. and O'Donnell, C., Principles of Management, New York, Holt, Rinehart and Winston, 1961.
- 33 - Krupp, S., Pattern in Organization Analysis, New York, Holt, Rinehart and Winston, 1961.
- 34 - Lazzaro, V., Systems and Procedures, Englewood Cliffs, Prentice Hall, 1968.
- 35 - Lebreton, P. and Henning, D.A., Planning Theory, Englewood Cliffs, Prentice Hall, 1964.
- 36 - Leonard, W., Management Audit, Englewood Cliffs, Prentice Hall, 1968.
- 37 - Levin, R.I. and Kirkpatrick, C.A., Planning and Control With PERT/CPM, McGraw Hill, New York, 1966.
- 38 - Linblom, C., Public Finances: Needs, Sources, and Utilization, New York, Princeton University Press, 1961.
- 39 - Lindsay, F.A., New Techniques for Management Decision-Making, New York, McGraw-Hill, 1965.
- 40 - Lockyer, K.G., Critical Path Analysis, London, Sir Isaac Pitman, 1966.
- 41 - Lyden, F.J. and Miller, E.G., Planning, Programming, Budgeting, Chicago, Markham, 1967.
- 42 - MacNeil, N., and Metz, H.W., The Hoover Report, 1953-1955, New York, The Macmillan Company, 1959.
- 43 - MacRae, S. and Page, S., Tools for Administrators in the Public Service, London, Edward Arnold Publishers, 1967.
- 44 - Millward, R.E., "PPBS: Problems of Implementation", Journal of the American Institute of Planners, March, 1968.
- 45 - Murdick, R.G., "Nature of Planning and Plans", Advanced Management Journal, October, 1965.
- 46 - Musgrave, R., The Theory of Public Finance, New York, McGraw-Hill, 1959.
- 47 - Novick, D., Program Budgeting, Cambridge, Harvard University Press, 1965.

- 48 - Optner, S.L., Systems Analysis for Business Management, Englewood Cliffs, Prentice Hall, 1968.
- 49 - Pfiffner, J.M. and Presthus, R.V., Public Administration, New York, The Ronald Press, 1960.
- 50 - Prest, A.R. and Turvey, R., "Cost-Benefit Analysis: A Survey", The Economic Journal, December, 1965.
- 51 - Quade, E.S., "Cost-Effectiveness: An Outline and Overview", Rand Corporation Paper p-3134, June 14, 1965.
- 52 - Rhind, R., "Management Information Systems", Business Horizons, June, 1968.
- 53 - Richards, M.D., and Greenlaw, P.S., Management Decision-Making, Homewood, Richard D. Irwin, Inc., 1966.
- 54 - Schick, A., "Systems Politics and Systems Budgeting", Public Administration Review, March-April, 1969.
- 55 - Schoderbek, P.P. editor, Management Systems, New York, John Wiley, 1967.
- 56 - Sewell, W.R.D., Guide to Benefit-Cost Analysis, Ottawa, Queen's Printer, 1962.
- 57 - Sharp, M.W., "Measurement of Efficiency in Government and Business", Canadian Public Administration, June, 1960.
- 58 - Simon, H.A., Smithburg, D.W. and Thompson, V.A., Public Administration, New York, Alfred A. Knoff, 1967.
-, Administrative Behaviour, New York, The Free Press, 1957.
-, The New Science of Management Decision, New York, Harper and Brothers, 1960.
-, The Shape of Automation for Men and Management, New York, Harper and Row, 1967.
- 59 - Smithies, A., The Budgetary Process in the United States, New York, MacGraw Hill, 1965.
- 60 - Stettler, H.F., Systems Based Independent Audits, Englewood Cliffs, Prentice Hall, 1967.
- 61 - United States Bureau of the Budget, Planning-Programming-Budgeting, Bulletin 66-3, October 12, 1965.
- 62 - Urquhart, M.C. and Buckley, K.A.H., Historical Statistics of Canada, Toronto, MacMillan, 1965.

- 63 - Vaughan, D.S., "State Budgeting in the United States",
Public Administration Survey, January, 1968.
- 64 - Wadia, M.S., editor, The Nature and Scope of Management,
Chicago, Scott, Foresman, 1966.
- 65 - Ward, N., The Public Purse, Toronto, University of Toronto
Press, 1962.
- 66 - Wilson, G.P., "Operational Auditing in the Canadian Federal
Public Service", Local Government Finance, April, 1968.
- 67 - Wildavsky, A., The Politics of the Budgetary Process, Boston,
Little Brown and Company, 1964.
-, "Rescuing Policy Analysis From PPBS", Public
Administration Review, March-April, 1969.