

AD 690531

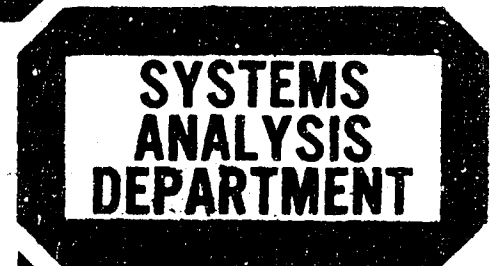
APR 1969 M69-51-1

PPBS AND FUTURE TRENDS IN OUR SOCIETY

Michael J. Flax



D D C
RECEIVED
JUL 30 1969
RECEIVED
C



This document has been approved
for public release and sale; its
distribution is unlimited.

M69-51-1

PPBS AND FUTURE TRENDS IN OUR SOCIETY

by

MICHAEL J. FLAX

THE
MITRE
CORPORATION
BOX 208
BEDFORD, MASSACHUSETTS

Any views expressed in this paper are those of the author. They should not be interpreted as reflecting the views of The MITRE Corporation or the official opinion or policy of any of its governmental sponsors. This paper is being distributed because of its general interest to the public and as a courtesy to the author.

ABSTRACT

A relationship is shown between some of the predicted changes in our society caused by rapid technological progress and the introduction of PPBS (Planning, Programming, Budgeting System) throughout government. A description of some of these changes and a review of the history and functional evolution of the PPBS methodology is provided as background for a discussion of this relationship.

TABLE OF CONTENTS

PREFACE		vii
FOREWORD AND ACKNOWLEDGEMENTS		ix
SECTION I	INTRODUCTION	1
SECTION II	SOME PREDICTIONS OF FUTURE CHANGE	3
SECTION III	HOW PPBS CHANGES OUR GOVERNMENTAL BUDGETING PROCESS	9
SECTION IV	SOME RELATIONSHIPS BETWEEN PPBS AND FUTURE CHANGE	13
SECTION V	SUMMARY AND CONCLUSION	17
APPENDIX	A TABULATION OF SOME BASIC DIFFERENCES BETWEEN BUDGET ORIENTATIONS	19
REFERENCES		23

PREFACE

More people, decreased space-time relationships, historically unprecedented output of material goods and an increasing rate of change characterize the recent past and will dominate the immediate future. The pace at which new problems are now multiplying and old ones escalating in the face of the traditional social inertia in approaching and solving such problems is already noticeable among the poor and the young. New ways of looking at institutional change are mandatory and this paper is addressed to one of these innovations.

Traditionally, our society has placed values on its goals and then generated means toward goal fulfillment. Often as a social stabilizing technique, the means have acquired the value of the goals. Hence, legal concepts (e.g., the Constitution and states rights) and institutions (e.g., the convention system and NATO) which are means, have been endowed with the values of the goals to which they were directed. It is the virtue of the PPBS system that it examines the output of means in terms of goal fulfillment. Hence, this may enable institutions which have in the past satisfactorily fulfilled their role of creating stability in a slowly adapting society to adapt to changing requirements more rapidly. On the other hand, where this stabilizing inertia works to the detriment of social wellbeing PPBS permits examination of means stripped of their value connotation.

A young child ventures into worlds fraught with failure hundreds of times a day. His failure rate is high but so is his learning rate. As he matures he opens himself less to situations in which he may fail and his learning rate slows. So too with society. PPBS may permit society to take more chances with institutional change while concurrently limiting the possibilities of failure. Perhaps it is too much to claim that this process alone will keep our society vital and dynamic in a world of growth, change and awesome technological innovation, but it certainly will assist in the adjustment which must be made. PPBS itself is a changing concept, and it must be freely criticized, evaluated, and modified to keep pace with changing requirements. This paper is devoted to some preliminary consideration of PPBS application in a world characterized by technological innovation. Although preliminary, it opens a new vista for democratic governments to manage social change in the interests of the citizenry.

Bedford, Massachusetts
April 4, 1969

Dr. William Marcuse,
Associate Department Head
Systems Analysis Department
The MITRE Corporation

FOREWORD

In the course of a bibliographic survey in support of Dr. Martin Jones for the Project Evaluation Model (PEM) Study recently conducted for the New England Regional Commission (NERC), certain relationships became evident between functional planning (as done in PPBS systems) and certain overall trends of our society. It is hoped that this paper will encourage further work in exploring the broader implications and relationships between innovation and planning methodologies throughout our society.

ACKNOWLEDGMENTS

The writer wishes to thank the following MITRE personnel for their comments and suggestions concerning the material presented: A. E. Autio, J. E. Hollingworth, M. V. Jones, W. Marcuse, C. Mankiewich, and C. R. Turner.

SECTION I

INTRODUCTION

A great deal has been written recently about the effects of technology on our society. Specifically, predictions are being made as to how the increasingly rapid progress in technology has already produced drastic changes throughout our society, and how the pace of these changes is bound to increase in future years (See References (1), (2)).

At the same time as these predictions are being made, a method of budgeting known as the Planning, Programming, Budgeting System (PPBS), originally developed and applied in the Defense Department, is being introduced throughout the Federal Government and in many State Governments.

In this paper I shall discuss how certain aspects of this budgeting system were made necessary by the rapid changes in society and will aid in coping with this phenomena. Thus, this paper will include:

1. a description of some of the present as well as predicted changes in our society resulting from the rapid pace of technology,
2. a description of the evolution and operation of PPBS,
3. a discussion of how PPBS implementation is related to these alterations in our society, and finally
4. a discussion of further implications of this relationship.

SECTION II

SOME PREDICTIONS OF FUTURE CHANGE

The rapid advance of technology does not in itself produce change. What it does is to create new possibilities for action; it alters and expands the number of choices that can be made. For example, as a result of satellite and electronics technology, we now have the option of building a world-wide weather data collection system, while nuclear technology gives us the option of building large desalinization plants in remote areas.¹

These same technological changes can also cause profound social changes. The automobile made our present suburbs possible and profoundly changed our habits in important areas ranging from sex to earning a living. Television has brought wars and riots into our living rooms, and it appears as though its effects are beginning to change our views on warfare and overthrow our conventional politics.

Since technological change has always caused profound social effects (the wheel, steam engine, telephone, etc.) what is so unusual about our present situation? Well known analysts, including Herman Kahn and E. G. Mesthene, (Ref. 1, 4) claim that the rate of change today is so much greater than ever before that it may be on the verge of causing an order of magnitude transformation of our society.

Our large number of well trained scientists² and the huge sums spent on research and development are resulting in a geometrical expansion in the rate and pervasiveness of technological change. Our system of large corporations linked with large universities competing in a relatively free market fans the flames of rapid innovation. Since we usually consider only first order effects when instituting changes, the imbalances resulting from past innovations (pollution, damage to the unborn, etc.) are causing us to step up our pace in seeking technological solutions to these problems.³ Of course the staggering sums spent on the armaments race as well as the space race have further intensified the rush to newer, better and less expensive technology.

¹ Albert Wilson expresses this thought as follows: "In an increasing number of technological areas we have recently moved from the regime of finding a way to the regime of choosing the best way. The task is no longer to remove material limitations, but to set up limitations of our own." (Ref. 3)

² 90% of all scientists who have ever lived are alive today. (Ref. 5)

³ Boulding comments: "where knowledge is an essential part of the system, knowledge about the system changes the system itself" (Ref. 6)

The large number of areas where far reaching changes have recently occurred, are occurring or are imminent stagger the imagination. A few of these areas and some of their effects on our society are listed as follows:

Ecology - an awareness of the creeping stagnation of our water resources; the danger of auto exhaust fouling the air of our cities.

Communication - TV's effect on political campaigns and conventions; wideband CATV permitting many information channels into every home.

Automation - more leisure, less need for unskilled labor; an undermining of the puritan ethic and the psychology of scarcity.

Computers - the rights of the individual vs. the efficiency of huge data banks; the information explosion.

Biology - ethical dilemmas of transplants; the possibility of creating "test tube babies"; the ethics of modifying human genetic material and the genetic process itself.

Health - the population and hunger explosions; the "pill" and its effect on morality.

Religion - the worldwide ecumenical movement; reform and rebellion in the Catholic Church.

Transportation - the accessibility of the whole world to jet travel; the ascendancy of the automobile over railroad and mass transportation; the desirability of the SST and its supersonic boom.

Weaponry - the irrationality of general nuclear war and the inability to "win" limited wars; the success of "political" and guerrilla warfare against superior firepower.

This listing could go on for many pages. The present magnitude of some of these changes is illustrated by the names commonly used to describe some of their effects--the population and information "explosions," the "balance of terror," etc.

Our values are being affected in many ways. Increased prosperity is weakening our puritan ethic. Skill in leisure is becoming more important, and the problems of distribution and the maintaining of levels of consumption are often much more difficult than the production of the goods themselves.¹ The increasing rate of changing values may mean that our emphasis will soon have to shift from the values themselves to the process of "valuing." Thus, since the substance of what we value (e.g., the "hard work" of the puritan ethic) is changing, we must devote more of our efforts into determining just what our values should be, rather than defending those we presently believe in.

These changes are occurring so rapidly and in so many areas at the same time that some authors believe that our society is becoming a society whose principal defining characteristic is change rather than stability. This would be the kind of world envisioned by the pre Socratic philosopher, Heraclitus, who saw change as the essence of being.² This concept of a "Heraclitian World" has profound implications in how we understand, organize, and evaluate the world. Most of our habits of language and thought, our institutions and practices, our politics, and our most cherished values were developed with the assumption that stability is more characteristic of the world than change, i.e., that change is but a temporary perturbation of stability or a transition to a new (and presumed better?) stable state.

It is true that in some ways our society is more willing to accept change than many others.³ However, it is the technological aspects of change which Mr. Nixon refers to. We Americans do enthusiastically encourage the rapid development of the newest technology. It is the secondary and

¹. The increase in leisure time may only benefit those involved in the direct production of goods. Those whose jobs call for understanding our society are caught up in a "feedback effect" from the information explosion and are busier than ever before!

². The term "Heraclitian World" to describe this state was introduced by Mesthene. A famous quotation from Heraclitus is "you cannot step twice into the same river, for its waters are continually flowing on." (Ref. 1)

³. Richard Nixon expressed this point of view as follows: "If there is a single quality that sets Americans apart, I believe it is their openness to change. They do not merely cope with change; they embrace it. They are committed to it. They gladly accept the wrenching pain of change in order to sieze its exciting promise." (Ref. 7)

unforseen spillover effects of these technological changes that are having such dramatic and often unexpected effects on our entire society. Even those who are aware of the reasons for these rapid and violent changes may find themselves disturbed and upset by the disruptions in familiar areas of their lives.¹

Those who are not aware of the reasons for these disruptions to their usual ways of doing things (and they are a large percentage of our population!) are terrified by the "decay in our values" and often vainly seek to return to the happier and simpler days of the past.

Thus, there is the prospect that many of our most fundamental metaphysical assumptions are in the process of being undermined, and this undermining of cherished beliefs may be exceedingly threatening to large segments of our society. The emphasis may increasingly tend to be on "process" (how things change) instead of "structure," (how things are at present) as the rate of change in our society continues to increase.²

Some of the changes that have been predicted as a result of this tendency toward a more Heraclitian society are listed below: (Ref. 1)

- a) An increased emphasis on knowledge and education. More intellectual, artistic and emotional occupations and less muscular and non-skilled work.
- b) A trend toward applied social science; toward problem-orientation as distinct from discipline-orientation in order to discover what it is we need to know--a need to ask new questions.
- c) Increased importance of interdisciplinary fields of inquiry.

¹ Marcuse points out that not only individuals, but the institutions of our society themselves, are extremely disturbed by and resistant to rapid change. Often these institutions are the principle obstacles to needed reforms (Ref. 8)

² Freeman Holiner expresses this metaphorically... "We know that change is now a condition of life--change is a new kind of equilibrium. We are learning to live with it, just as a child with a new bicycle discovers that, in motion, his vehicle is more stable than it is at rest." (Ref. 9)

- d) New policy oriented research organizations arising at the borderlines of industry, government and universities in the no-man's land between the public and private sectors of our economy.¹
- e) An increase in life long education and a breakdown of the lifelong constancy of a single trade (which has often been the basis of many workers' personal identity and sense of individuality). A greater need for occupational flexibility and problem solving ability (rather than a knowledge of factual information in a given field).

The thesis of this paper is that the institution of PPBS is a result of many of these changes and that its institution enables society to better control the direction of these changes and cope with their effects. In the next section the historical evolution and some of the characteristics of PPBS will be described.

¹E.g., The Institute for the Future (IFF), Middletown Connecticut, and the Urban Institute (UI), Washington, D.C.

SECTION III

HOW PPBS CHANGES OUR GOVERNMENTAL BUDGETING PROCESS

The Planning, Programming, Budgeting System (PPBS) technique was developed in the late 1950's and extensively applied in the Department of Defense. In October 1965 the President directed that it be applied throughout the U.S. Federal Government.

An informative way of looking at the PPBS system is to view it in historical perspective as a forward step in the history of budget reform. This has been done by Allen Schick (Ref. 10), and the following presentation draws upon many of the concepts presented in his article.

The process of running an organization can be considered to consist of three stages:¹

1. Planning - what are the long range goals and the tasks required to achieve them?
2. Management - what is the best way of accomplishing a prescribed task?
3. Control - assuring that these tasks are carried out effectively and efficiently.

Theoretically, the budgeting process could aid in all three functions. From a practical and historical point of view, the budgeting authorities have tended to concentrate principally on one function at a time. However historically the emphasis has shifted from "control" to "management" and now, with the introduction of PPBS, to the "planning" function.

The type of information needed, the time in the budgeting cycle when this information is required, the desired levels of aggregation, and the sources and destinations of data tend to differ, depending on which of the three functions is emphasized in a particular budgeting system.

¹Anthony (Ref. 11) uses different terms ("strategy," "management," "operational") to describe a similar breakdown of an organization's functions.

During the years 1920-1935 the dominant emphasis in governmental budgeting was on "control" of expenditures. Government was regarded as a necessary evil, and the major emphasis was in keeping expenses to a minimum and preventing irregularities.

With the advent of the New Deal, government was to be used as a means of improving society and there was greater emphasis on the "management" function in governmental budgeting. This "performance budgeting" approach led to reform in the appropriation structure, and the development of work measurement programs and sophisticated cost accounting techniques, as well as emphasis on the application of "scientific management." The Hoover Commission Reports represent this approach to budgeting.

Within the last ten years, with the introduction of PPBS, the "planning" function has been emphasized. Here the expenditures are categorized functionally according to the goals that they enhance (i.e., transportation, health, etc.) regardless of the agency by which they are spent. The objective is to rationalize policy making by providing data on the costs and benefits of alternate ways of attaining proposed public objectives, and to develop output measurements to facilitate the effective attainment of these objectives. This progression in budgeting techniques from one emphasis to the next has many implications throughout governmental organizations, some of which are summarized in the Appendix.

With the introduction of PPBS the dominant skills needed in the budgeting process have tended to change.¹ Overall purposes rather than activities or specific objectives are emphasized. The "planning" function is performed before the complete preparation or execution of the budget. Since all funds expended toward a given function (regardless of through which government agency they are spent) can be examined, an improvement in overall effectiveness can be obtained by emphasis on the choice of the more advantageous policies and goals rather than by efficiency in specific activities or accurate accounting for expenditure and goods.

¹ Many originally accounting oriented agencies such as the Bureau of the Budget and the General Accounting Agency are now adding economists and engineers to their staffs in order to gain competence in performing cost/effectiveness studies. (Ref. 12)

The budgeting decision flow for PPBS is from a centralized planning group rather than from each operating agency,¹ and thus the choices made by its practitioners tend to evaluate overall programs rather than incrementally modifying the yearly expenditures. Thus, the responsibility for "planning" is centralized as opposed to centralized "management" or "control" responsibility for the previous budgeting orientations. The fact that under PPBS the appropriation and budget classifications are different (since many different agencies may perform the same function) and that the link between each organization and its appropriation is indirect, accounts for many of the difficulties involved in implementing the new functional type budgeting accounts.

The widespread introduction of PPBS throughout all levels of government, advances in the techniques of operations research and systems analysis, and the advent of computer techniques for rapidly accessing and manipulating large quantities of data, provide a powerful new tool for increasing the effectiveness of the public sector of the economy and coping with the increasingly rapid rate of change.

¹ This does not preclude the operating agencies from performing analyses and submitting them to the centralized planning group. It is the decision making function rather than the analysis function which is centralized.

SECTION IV

SOME RELATIONSHIPS BETWEEN PPBS AND FUTURE CHANGE

The development of PPBS budgeting techniques are directly related to the technology induced changes noted earlier in this paper. In the first place, in some respects the advent of PPBS was in response to these changes. Secondly, in many ways the development of PPBS from earlier forms of performance budgeting parallels other developments in our society. Finally, the implementation of PPBS will itself tend to influence the direction of some of these changes and aid in coping with them. In the following paragraphs I will discuss these three aspects of the PPBS - changing society relationships.

1. As technological change proceeds at an ever increasing pace, new alternatives appear more often and the consequences of individual decisions have shorter lifetimes. Thus, there is a necessity for making a greater number of decisions which reevaluate entire programs. Also, because of this increased rate of change, past experience alone is no longer as valid a basis for our decisions. We need assistance in keeping track of the many costs, direct benefits, and spillover effects of entire programs. PPBS helps fill this need for decisions by providing a structured methodology toward an overall approach to programs being evaluated, in contrast to the incremental approach of earlier budgeting methods.

As the complexity and cost of larger projects increases, the PPBS approach provides formalized and explicit methods of more accurately measuring the costs and effects of such large projects and handling the larger amounts of data meaningfully. It also enables larger numbers of people from many disciplines to become involved with the issues in the making of decisions by providing a structured method for disciplining the dialogue between them. (This lack of communication between specialists in different disciplines is a growing and difficult problem.¹)

As government engages in more large scale social welfare projects, where dollar costs and profits are not satisfactory indicators of program desirability, PPBS provides a vehicle for

¹ Boulding observes that "too many experts devote their lives to finding the best way of doing something that should not be done at all." (Ref. 6)

developing measures of social effectiveness more rationally. It also can aid in the distributing of public resources in a more beneficial manner.¹

2. Not only is PPBS a means of responding to the above changes, but its development also parallels certain trends in our society. As our universities, "think tanks" and R&D corporations are becoming more problem rather than discipline oriented, the budgeting process in PPBS is also becoming oriented toward overall functional performance rather than efficiency in individual task areas. Our society is becoming more and more concerned with the process of change as opposed to the present existing structure, and our educational establishment is becoming increasingly oriented toward principles and techniques rather than just knowledge of the existing situation. In an analogous manner the PPBS budgeting system reflects this by putting increased emphasis on the overall objectives of policy as opposed to the details of managing efficiently or controlling the disposition of funds.²

3. Finally, in many ways PPBS itself will tend to cause future changes to occur in a more orderly fashion, and aid society in coping with them. For example, as a result of increased specialization (combined with rapid technological change), there are many specialists pursuing their disciplines in areas where they are no longer functionally justified (e.g., the electronic tube designer who has not become skilled in integrated circuits).

By emphasizing the functional benefits of programs, pockets of efficiency without justifiable function will tend to be phased out more rapidly. (Both public and private funds and programs will be needed here in order to avoid undue hardship). Similarly, numerous governmental and defense facilities that have outlived their functional usefulness may be brought to light by means of PPBS functional analysis techniques, and their capabilities to useful tasks.

¹ Critics of PPBS have claimed it overemphasizes quantitative measures. If PPBS is used effectively, new and more effective quantifiers will be developed, and non-quantitative factors will be explicitly defined and taken into account. Jones has outlined this type approach in a study for the New England Regional Commission (Ref. 13)

² As Hitch and McKean (Ref. 14) point out, the overall policy objectives and the costs of attaining them are as "interdependent as the front and rear sights on a rifle." What is meant here is that increased emphasis is placed on overall objectives; not that the budgeting functions of efficiency and control are neglected.

By bringing to light unforeseen spillover effects, and by forecasting difficulties that the introduction of technological changes might induce, PPBS will help in the more rational management rapid change.

The PPBS techniques are no panacea for society's ills, and there are dangers involved if the PPBS methodology is misused. Complex analytical studies may be used to give increased emphasis to quantifiable measures, and cause the neglect of effects that cannot be accurately quantified.¹ The mystique of computerized outputs may allow the results of analytic models to dominate the decision models. The wisdom of experience² and common sense may not be permitted to temper analytical outputs.

Adam Yarmolinsky provides an excellent statement of the limitations of computers as decision makers (Ref. 15).

"...computers can provide no substitute for this process of judgment based on experience. But they can make it easier to acquire and marshal the facts that can be subject to analysis. Any tool that facilitates the collection and organization of data in a complicated and changing fact situation is a significant aid to judgment. Of course, computers are useful in assembling the facts on which to base a decision. So are the typewriters and adding machines. But no one suggests that we consult a typewriter or adding machine in reaching a decision. Like computers, they are taken for granted."

"There is one way in which the electronic revolution may expand the scope of creative decision making in the military establishment and elsewhere. It has been suggested that a measure of creativity is the ability to hold a relatively large number of ideas in suspension, allowing them to arrange themselves in a number of different ways. The electronic

1. Boulding comments that often "the rationalized process can only take subsystems in their more exact fashion, and being rational about subsystems may be worse than being not very rational about the system as a whole." (Ref. 6)

2. Even though it is true that past experience will be less important in future decision making, an experienced decision maker is needed to interpret and integrate the results of analytical studies.

revolution offers the creative planner and strategist greater scope, as it makes available more data, assembled more rapidly, from a wider geographic range of sources, and more easily combined and recombined. The rest is up to the human mind."

Thus, if PPBS is used mechanically without insight, the quality of decision-making may suffer rather than benefit.

On the other hand, functional budgeting as practiced within the PPBS structure can be used to make explicit many second order effects and discover promising alternative methods of reaching a desirable goal. Analytic modeling can be used as a tool for making data more explicit and accurate and as a guide rather than as a substitute for the decision maker. Used this way PPBS has the potential of improving decisions by highlighting what tradeoffs are being made, and indicating just which interest groups are paying the costs and which are reaping the benefits. By making explicit the expected results of alternate policies it can improve the forecasting process, and so help to control the effects of the introduction of new technology. By focusing attention on more varied data and more numerous alternative possibilities it can improve the political decision-making process by allowing the Congress and the electorate to become better informed. Additional planning and more comprehensive data can force earlier consideration of painful problems that are often hidden behind slogans or indifference. The amelioration of such problems as hard-core poverty and unemployment might be less difficult and expensive if tackled before they reach the critical stage.

The PPBS system may tend to encourage the asking of meaningful but uncomfortable questions by forcing more rational thinking in setting goals and objectives. For example, just what are our objectives in building large weapon systems? How much of our motivation is toward the defense of the country, and how much toward the development of new technology? Are we also interested in keeping scientists employed, and do we also like to play with fancy hardware? The earlier such questions are asked the better we can cope with the answers. Today such questions are beginning to be raised concerning atomic deterrence; tomorrow we may have to ask them concerning the modification of human genetic material.

Finally, the PPBS system can help in establishing relationships between the input resources invested in alternative programs and their output benefits. This can result in a more effective utilization of society's resources. In all these ways PPBS can aid government planners and citizens in coping with the avalanche of changing factors which confront us all.

SECTION V

SUMMARY AND CONCLUSION

This paper has attempted to indicate some of the interfaces between our changing society and the introduction of PPBS, a comparatively recently implemented budgeting and planning technique.

First, some of the causes of the increasingly rapid pace of change in our society were discussed and some of the predicted new developments were described. The possibility was raised that the magnitude and pace of this change may be on the verge of causing a structural change in our society; i.e., we may be approaching a society where the process of change itself will be more significant than present structure.

These rapid modifications of both our habits of thought as well as of our physical environment may impose tremendous strains on both individuals and institutions in our society. An awareness of this phenomenon may be a significant first step in devising methods of adjusting to it.

Next, this paper has included a description of the evolution of the budgeting process; from emphasis on "control" of funding, to the encouragement of "managerial efficiency", to the present concept of emphasis on more efficient overall "planning."¹ Some of the characteristics of all three of these phases of budgeting were described.

Finally some cause and effect relationships between increasingly rapid change and the introduction of PPBS into government were described and discussed.

¹In the future there may be a need for an even "higher level" of aggregation than the present functional breakdowns of PPBS. For example, the studies to locate a new airport in the Boston area (transportation function) and a new Medical Center for the University of Mass. (health function) were carried out separately. There is great local opposition to an airport and local desire for a medical center. If some higher level (the governor?) could offer a combination of "good" and "bad" programs to a given area the political problems of fairly locating these type facilities might be more easily solved.

It was shown how PPBS was developed in response to some of the recent changes in our society, how its development has paralleled some of these changes, and how it offers a methodology for predicting and influencing the direction of many of these changes.

In a time of rapid and often uncomfortable changes the intelligent use of the PPBS technique may provide a method for the more rapid and rational resolution of the stresses such rapid change is certain to produce throughout our society.

APPENDIX

A TABULATION OF SOME BASIC DIFFERENCES BETWEEN BUDGET ORIENTATIONS

Table I tabulates some of the pertinent characteristics of the three types of budgetary systems discussed in this paper. It also lists some apparent trends in the progression from "control" to "management" to "planning" oriented budgets.

Note that the "control" oriented budget tends to utilize personnel with accounting skills. It emphasizes "how much things cost" and the principal role of the budgeting agency is a judiciary one, i.e., to insure that the funds are spent as directed. The decisional flow is upward, that is the lowest operating level estimates its projected expenses and these are used as building blocks (aggregated) for the next higher level's estimates, until the highest level is reached, and the totality constitutes a department wide budget.

The "control" oriented budget encourages incremental type decisions since its approach is "this is where we are: where do we go from here?" The responsibility for controlling funds is centralized, since the prime function of this type budget is assuring that funds are not misspent. Major advantages of this form of budgeting are the fact that the budget classifications are easy to follow (e.g., the cost of typewriters and desks) and those classifications used for the appropriation of funds are the same as those used by each organization.

The "management" oriented budget emphasizes personnel with administrative skills, and deals with how much it costs to perform specified activities (e.g., painting, machining, programming, etc.), and its principal emphasis is on performing activities in a most efficient manner. Also, cost estimates flow upward from lower operating levels and are aggregated to prepare department level budgets. Again, the tendency is to modify existing budget structures in an incremental manner.

Since "management" is the principal orientation of this type budget, this is the function that is centralized, while the "control" and "planning" functions are performed by each operating department. As in "control" oriented budgets the classifications used are familiar and present no unusual difficulties.

The "planning" (PPBS) oriented budget utilizes personnel trained in economics or systems engineering, deals with the overall goals of the organization, and attempts to formulate policy. These policy decisions are made at the top (after having received inputs from below)

TABLE I

SOME BASIC DIFFERENCES BETWEEN BUDGET ORIENTATIONS²

Characteristics of Different Type Budgets	Type of Budget			Apparent Trend
	"Control" Orientation	"Management" Orientation	"Planning" Orientation	
Dominant Personnel Skill	Accounting	Administration	Economics/Systems Engineering	Specialist → Generalist
Principal Information Focus	Specific Objects and Items	Activities	Purposes or Goals	Things → Ideas
Principal Role of Budget Agency	Fiduciary	Efficiency	Policy	Short Term → Long Term
Decision Flow in Budget Preparation	Upward/ Aggregative	Upward/ Aggregative	Downward/ Dispersed	Not applicable
Type of Choice Encouraged	Incremental	Incremental	Overall Evaluation	Improvement → Restructuring
Control Responsibility ¹	Centralized	Operating Department	Operating Department	Centralized → Disbursed
Management Responsibility	Operating Department	Centralized	Operating Department	Not applicable
Planning Responsibility	Dispersed	Dispersed	Centralized	Decentralized → Centralized
Classifications used in Budget and in Appropriations	Same	Same	Different	Organizational → Functional
Comparisons Between Appropriations and Organizational Funding	Direct	Direct	Indirect	Organizational → Functional

¹. All three types of budgets must take into account all three orientations - it is a question of which receives primary emphasis.

². This is a modified version of a chart found in Reference 10, p. 258.

and then are disseminated throughout the organization. This type orientation encourages the evaluation of the effects of overall programs rather than implementing incremental changes. The "planning" function is centralized while the "control" and "managerial" functions are dispersed. Since this form of budgeting uses functional classification which differs from the required organizational funding breakdowns, it is necessary to devise methods of translating one to the other (often called "crosswalk").

REFERENCES

1. Emmanuel G. Mesthene, How Technology Will Shape The Future, Science, July 1968, pp. 135-143.
2. Don Fabun, The Dynamics of Change, Prentice Hall, N.Y., 1968
3. Zurkey & Wilson, New Methods of Thought and Procedures, Springer-Verlag, New York, 1967
4. Herman Kahn, The Year Two Thousand, MacMillan, New York, 1967
5. Time Magazine, 24 January 1969, p. 19
6. Kenneth E. Boulding, Richard T. Ely Lecture, American Economic Review, May 1966, p. 11
7. Richard Nixon, Campaign Address, July 6, 1968.
8. William Marcuse, MITRE Systems Analysis Department, informal communication, March 1969
9. Freeman Halmer, Management Research in State and Local Government Operations Research, November 1968, p. 1093
10. Allen Schick, The Road to PPB - The Stages of Budget Reform, Public Administration Review, December 1965, p. 271
11. R. N. Anthony, Management Accounting, Richard D. Irwin, Inc., 1960
12. The Growing Power of GAO, Space Aeronautics, August 1968, p. 28
13. Martin V. Jones, A Regional Project Evaluation Model, MITRE Corp. M68-16, August 1968
14. C. J. Hitch and R. N. McKean, The Economics of Defense in the Nuclear Age, Harvard University Press, Cambridge, Mass., 1960 p. 3
15. Yarmolinsky, Adam, The American Scholar, Spring 1966, p. 272

DOCUMENT CONTROL DATA - R & D

Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified.

1. ORIGINATING ACTIVITY (Corporate author) The MITRE Corporation Bedford, Massachusetts		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	
		2b. GROUP	
3. REPORT TITLE PPBS AND FUTURE TRENDS IN OUR SOCIETY			
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) N/A			
5. AUTHOR(S) (First name, middle initial, last name) Michael J. Flax			
6. REPORT DATE April 1969	7a. TOTAL NO. OF PAGES 23	7b. NO. OF REFS 15	
8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S) M69-51-1		
b. PROJECT NO.	9c. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) M69-51		
d.			
10. DISTRIBUTION STATEMENT This document has been approved for public release and sale; its distribution is unlimited.			
11. SUPPLEMENTARY NOTES N/A		12. SPONSORING/MONITORING ACTIVITY	
13. ABSTRACT <p>A relationship is shown between some of the predicted changes in our society caused by rapid technological progress and the introduction of PPBS (Planning, Programming, Budgeting System) throughout government. A description of some of these changes and a review of the history and functional evolution of the PPBS methodology is provided as background for a discussion of this relationship.</p>			

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
<p>Systems Analysis PPBS (Planning, Programming, Budgeting System) Governmental Budgeting Cost/Benefit Analysis Forecasting Technological Change Project Evaluation</p>						