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State of Iowa · Department of Public Instruction

A Comprehensive Planning Process for the State Department of Public Instruction

Suitable for Application in Iowa Education Systems

A COMPREHENSIVE PLANNING PROCESS FOR THE STATE DEPARTMENT OF PUBLIC INSTRUCTION

Suitable for Application in
Iowa Education Systems

A Comprehensive Planning Process for the State Department of Public Instruction: one of seven reports emanating from the--

COMPREHENSIVE PLANNING FOR STATE EDUCATION AGENCIES PROJECT

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Comprehensive Planning for State Education Agencies Project

State of Iowa
DEPARTMENT OF PUBLIC INSTRUCTION
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Preliminary Draft

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FOREWORD

The concept of planning as a process has applicability to education systems at all levels, ranging from the local school system at one end of the organizational continuum to the U. S. Office of Education, at the other end.

By replacing SEA, which stands for State Education Agency wherever it appears in this report, with LEA (Local Education Agency) or letter symbols representing the reader's level of school organization, the planning process concepts presented are worthy of the reader's serious consideration.

This report is disseminated with the hope that it will stimulate school leaders to focus attention upon the area of planning as an emerging process which can support educational decision making as a leadership function.

Paul F. Johnston
State Superintendent of Public Instruction

ACKNOWLEDGMENTS

The writer is greatly indebted to the men and women in Iowa--to those who serve in the field of education, and to those who are the patrons of the educational system, for their continuing concern and cooperation in striving to make the Iowa public schools the best in the nation. Also, to my colleagues, Dr. Paul M. Mitchum, Arthur C. Anderson, and Bernarr S. Furse for their effective support of and participation in the CPSEA project activities which culminated in the publication of this report. And last, but by no means least, to Miss Rebecca Kemble, a most efficient young lady who joined the CPSEA project as clerk-stenographer I in mid-year following graduation from Des Moines Roosevelt High School. Miss Kemble's patience in retyping this report many times during the feedback validity process and her competencies in stenographic and typing skills is a credit to her as an individual with a promising future in the Department, and to her high school teachers.

Joseph Wolvek

CHAPTER I
INTRODUCTION

To the Reader

The format of the Iowa report is designed to indicate the outcomes of a one year study as they relate to the Iowa state education agency's objectives.

Table 1 shows the outline rationale we have utilized. This representation may help the reader to better understand how the material in each of the sections of this report is related to the overall objectives of the multi-state project.

TABLE 1
ORGANIZATION OF MATERIAL CONTAINED IN THE IOWA REPORT

Contents of Report	Iowa State Education Agency (SEA) Objectives.	Multi-State Project Objectives.
CHAPTER I Introduction	Identify the most feasible way in which the Iowa SEA may improve its capability and functional operation for planning.	Identify a variety of ways by which state education agencies may organize for planning.
CHAPTER II Planning: Functions Processes Techniques	Identify basic process concepts by which planning may be operationalized for the purpose of providing information required to support all levels of SEA decision making.	Identify sources of data inputs which are necessary to support the planning function. Identify processes and techniques necessary for planning in State Education Agencies.
CHAPTER III Structure	Identify desirable organizational structure and role of planning unit. Identify desirable place of planning unit for line or staff roles within the SEA organizational structure.	Identify the in-agency role of a planning unit and its relationship to other operating divisions.

CHAPTER IV Staff Development	Identify anticipated planning unit staff responsibilities and develop descriptions of related planning unit staff competencies. Identify in-service training requirements essential to: maintaining in-house planning unit staff competencies at a desired level providing leadership for out-of-house public school agencies development of planning capabilities.	Identify inter-agency relationships and linkage to other state or regional planning missions. Identify the personnel skills and competencies needed for planning.
CHAPTER V Recommendations	Identify ideas to be explored for short, intermediate, and long range goals whereby practical planning capacities of the SEA may be developed in keeping with anticipated demands placed upon SEA decision makers by the real world environment.	Report variety of SEA Planning Strategies in Multi-State CPSEA Publication.

COMPREHENSIVE PLANNING: A PERCEIVED NEED

In the State of Iowa, planning and programming by the State Department of Public Instruction are activities which are authorized by legislation.[1]

During the 1965-66 school year, a new organizational structure for the State Education Agency (SEA) was adopted by the State Board of Public Instruction. This reorganized structure included a Planning, Development, and Evaluation staff (see Fig. 1). This staff, consisting of eight consultant positions, is directly responsible to the State Superintendent with secondary responsibilities to the branches in the Department, both directly and through the Office of Assistant Superintendents.

The primary purpose for which the Planning, Development, and Evaluation staff was created, was to be responsible for the development of new programs and concepts of education as assigned by the State Superintendent of Public Instruction.

The individual staff members were assigned to top priority tasks, such as: assisting the sixteen Area Education Districts with problems directed to the improvement of education; implementing a Study of Elementary and Secondary Education in Iowa; planning and development of a reorganized program of vocational rehabilitation services as an integral component of the SEA; developing school standards in cooperation with the Advisory Committee on Standards; assisting school officials in researching legal statutes and opinions; editing the quadrennial edition of School Laws of Iowa and departmental rules for the Department Rules Review Committee; and assisting in the planning and development of

[1]School Laws of Iowa, State of Iowa, 1966. (Section 257.9 subsection 1; Section 257.10 subsection 6, 7, 8, 9; Section 257.17 subsection 2, 3; Section 257.18 subsection 18.)

State of Iowa
DEPARTMENT OF PUBLIC INSTRUCTION
ORGANIZATION CHART

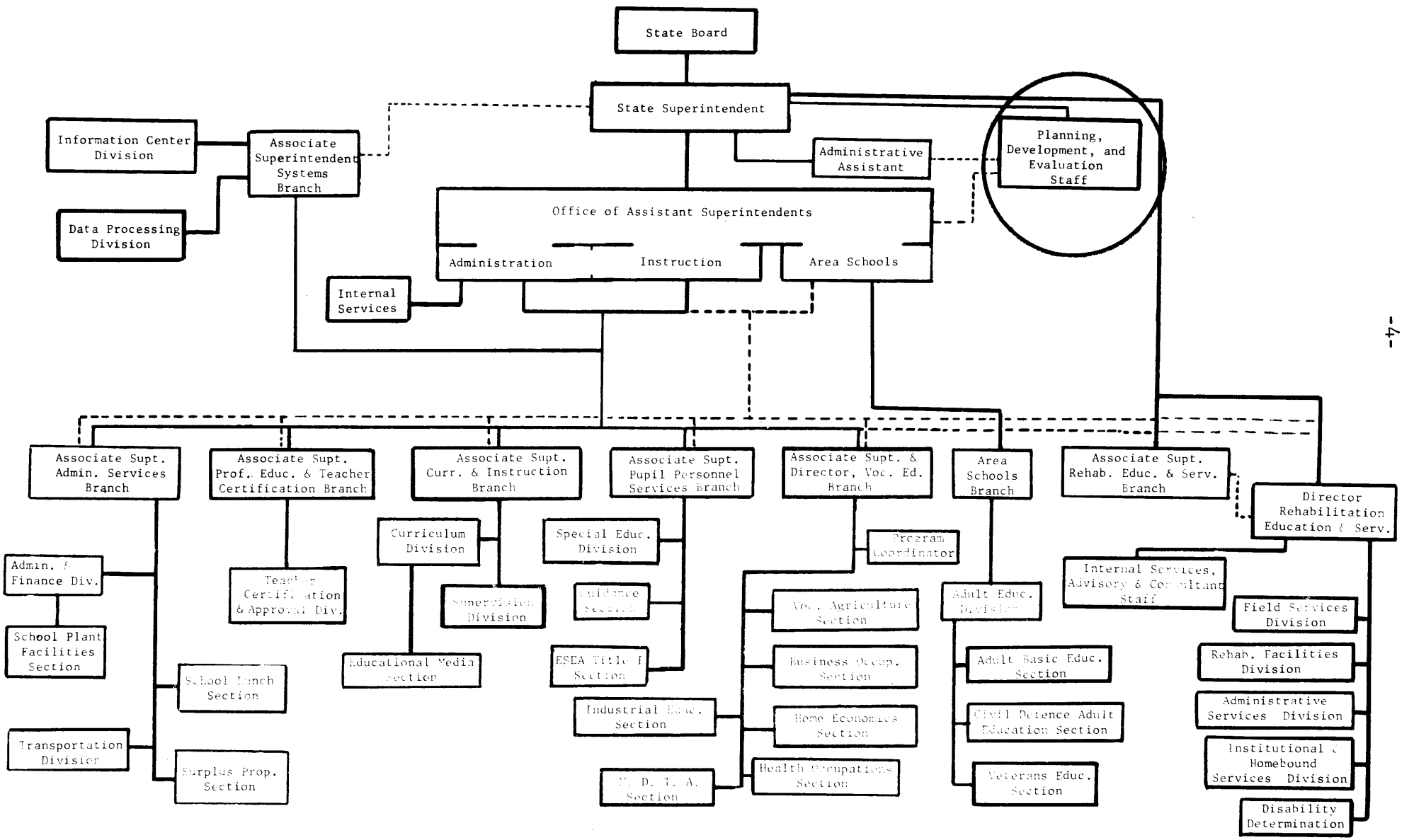

Fig. 1 Place of Planning, Development, and Evaluation Staff in the SEA Organization Structure

strengthened departmental relationships with various federal, state, and community programs.

The above assignments have been carried out in depth by individual planning staff consultants, leaving only a limited amount of time in which to coordinate the overall task of general planning for the SEA.

Early in 1967, the Iowa Superintendent of Public Instruction discussed with a number of other chief state school officers a felt need to develop a practical and systematic procedure for designing and implementing SEA planning staffs that would identify ways which would guide prospective future state educational planning activities into those channels which would show the greatest promise for identifying and attaining desirable objectives. The participating organizations included the state educational agencies of Colorado, Connecticut, Iowa, Texas, Utah, West Virginia, and the educational agency of the territory of Puerto Rico. It was agreed that Utah would be the administering state agency, and Bernarr S. Furse of that agency would serve as project director. A project application was submitted to the United States Office of Education for approval for funds provided in Section 505 of Title V, of P. L. 89-10, the Elementary and Secondary Education Act. The project was approved and funded on March 9 of that year.

The multi-state and Iowa project objectives are shown in Table 1. (see page 1). The multi-state project activities included an intensive training program attended by the project staff from each of the cooperating state agencies; periodic meetings of project staffs to share ideas, experiences, and problems; and, as the project neared termination, the planning of a summary report defining comprehensive education plan-

ning and illustrating the development of this planning capability in each of the cooperating state education agencies. These reports were combined in an overall multi-state document indicating some of the ways possible by which state education agencies might develop a comprehensive, integrated educational planning program aimed at achieving maximum utilization of resources in the development of state educational programs and in providing optimum services and leadership to the local school systems.

The introductory section of this report is a description of how the staff employed in the SEA project unit set about to achieve the Iowa objectives.

Implication for Change

The expressed intent of the SEA for participating in the multi-state project was to improve its overall planning capabilities. This objective was formulated by a felt need for change which may have been motivated by reasons ranging from, identified gaps in the planning capacity of the SEA to the desire to restructure planning outcomes to provide a greater range of realistic decision alternatives to the SEA policy makers and administrators. Whatever the reason or reasons, the Iowa project staff believed that the ability to effect change for planning was equally as essential to the SEA, as was the identification of objectives underlying the improvement of its planning capabilities. For this reason, the project staff has been guided both in the conduct of the study and in the identification of SEA objectives, by a set of principles upon which effecting change depends. The principles which were identified may be summarized as:

1) Change implies movement from what is now to what might be. Before change for an organization is indicated, one must have,

a) a valid understanding of what is now,

b) a reason for change in terms of a valid understanding of what is desired by the real world environment that cannot be accomplished by what is now, and

c) a valid understanding of what might be in terms of: what is desired by the real world environment, and practical specifics at the functional or operational level of the organization.

2) Change, without trauma, is best effected gradually, paced to an organization's ability to accept and assimilate it.

3) Change is best accepted by an organization if it comes from within as a result of felt need by the major organization elements that control its ability to change.

4) Change is best assimilated by an organization if the change provides empirical evidence that it:

a) endures the test of time in achieving desired ends, or,

b) sets the stage upon which acceptance of sequentually related phases of change depend.

ESTABLISHMENT OF SEA PLANNING CRITERIA

Before the project staff initiated construction of a planning model suitable for the SEA, a set of planning criteria was drafted based upon the principles of change identified earlier, and validity feedback information we had received from elements in the SEA system, as indicated in the document history of the criteria.

A STATEMENT OF BASIC PLANNING PRINCIPLES TO SERVE AS CRITERIA FOR STATE PLANNING PROJECT STAFF EFFORTS[1]

Document History

Submitted to	For Purpose	Action Taken
State Superintendent Mr. Paul F. Johnston	Review and Evaluation	Approved
Mr. Walter T. Edgren Assistant Superintendent	Assessment	Excellent
Dr. LeRoy Jensen Assistant Superintendent	Assessment	Good
Association Superintendents (Cabinet)	Assessment	Positive Consensus
Supervisory & Professional Personnel of SEA	Assessment	Positive Consensus

Definition of Terms

Comprehensive

(Exists in two dimentions: Depth and scope)

(a) Depth: the application of a detailed systems analysis concerning any given problem or set of related problems. (Depends upon logic model indicating sequential structure necessary to the ordering of identification, study, and analysis activities.)

(b) Scope: the identification of present or anticipated problems or related problems.

Input(s)

Refers to material which a process utilizes.

Model

A generic pattern which may be applied to a specific process or related set of processes.

Planning

A process of preparing information in the form of a set of alternatives and consequences of alternatives to aid in decision making.

Problem

An event or activity that occurs or develops in a manner which deviates from the anticipated or desired.

Process

An analytic activity which utilizes material provided for the purpose of producing a desired product.

Scientific Method

A process for identifying: needs, related problems, possible solutions, and testing the validity of solutions.

System

The sum total of elements working independently and interdependently within an environment to which a problem may be directed.

Valid

Consistent with reality.

List of Criteria

It is the responsibility of the State Education Agency to develop a comprehensive, integrated educational planning program aimed at achieving maximum utilization of resources in the development of the State educational program and providing optimum services and leadership to the local, intermediate and area systems.

Comprehensive planning is a research oriented service function undertaken on behalf of policy and decision makers in need of valid information which is pertinent to their tasks.

A comprehensive planning unit works to provide information that may be utilized within the structure of existing organization.

The information produced as a result of comprehensive planning to help identify a solution to a problem must be consistent with the underlying causes of the problem, and must not be distorted due to an inadequacy or bias of the planning process itself.

Valid information is gained from involving factors of the environmental system related to a problem, and not from assumptions made by planning personnel.

"Long range (planning)" and other modifiers are not characteristics of the planning process. Such modifiers are most appropriate in describing the nature of a problem input which at times may be subjected to the planning process.

Although the process of good decision making at all levels of administration utilizes the model of the scientific method, the nature of decisions at various administrative levels varies, thus requiring different information as a result of different problem inputs.

From the viewpoint of feasibility and efficiency it is desirable for each major level of organization, i.e., local school district, intermediate school structure, area school district, state education agency, regional multi-state area, and U. S. Office of Education to develop planning units designed to cope with the variety of problems encountered at each respective level.

To maximize comprehensive planning it is desirable to maintain an efficient communications network between the different levels of educational organization and between social institutions, industry, and governmental agencies engaged in activities which are of concern to education.

The administrative structure (SEA) which has legal authority for implementing a planning unit should identify a generic model which is indicative of:

1) a delineation of scope of functions in which the unit is to engage;

2) the administrative structure of the unit;

3) the place of the planning unit in the organizational structure;

4) a description of responsibilities of unit personnel;

5) a description of desirable professional background of each member of the unit;

6) and a description of adequate support services and necessary housing requirements.

[1]A Statement of Basic Planning Principles to Serve as Criteria for State Planning Project Staff Efforts, Iowa Project Unit, CPSEA, Document Index No. 1, August 7, 1967.

COMPREHENSIVE EDUCATIONAL PLANNING

Among the first tasks facing the SEA project staff was the formulation of a valid operational definition of the activity to which the project was addressed. In identifying what is meant by comprehensive educational planning as it relates to the SEA, staff members studied definitions provided in literature from a variety of sources; concepts of experts which were presented in the multi-state project training sessions; opinions from elements of the real world environment which

included: policy and administrative decision makers from a variety of educational institutions, including the SEA, and representatives from a cross section of political, social, business and industrial agencies and institutions located within the state.

We found two concepts which were prevalent and which served to dichotomize the definition of the term "comprehensive educational planning."

The first concept we dubbed traditional. It defines planning as a method for carrying out a pre-determined design. Proponents of this concept tend to see comprehensive educational planning as a master blueprint indicating all of the goals worth achieving and the methods for attaining them.

The second concept we dubbed emerging. It defines planning as a multi-level process for providing information upon which decision making is dependent. Proponents of this concept tend to see comprehensive educational planning at one level, focusing upon information concerning the identification of worthy objectives, goals, desires of the real world environment, etc. At another level, it focuses upon providing information which will identify the best possible allocation of resources and time necessary to the attainment of specified performance. And at a third level, it focuses upon information necessary to the evaluation of performance, or goal attainment.

Our next step was to draft an operational definition of comprehensive educational planning which we believed would be consistent with the principles for effecting change that we had earlier identified and to which we were committed. Our definition focused upon three

important factors: educational planning, problem inputs, and comprehensiveness.[1]

Educational Planning: A process of preparing information in the form of a set of alternatives and consequences of alternatives to aid in decision making for policy formulation and administrative action to determine the direction which educational activities should take.

Problem Inputs: For the purpose of decision making, a problem input is any event or activity that occurs or develops in a manner which deviates from a desired objective or goal.

Comprehensive: This term is defined with regard to both scope and depth.

1) scope: recognizing human limitations for identifying all elements which the term comprehensive implies, it is essential that the planning process is designed to allow for:

a) continuous renewal and updating as integral components of the process and,

b) effective processing of problem inputs that may be encountered in the future.

2) depth: the application of a detailed analysis concerning any given problem input or set of related problem inputs which will define such inputs in a logically sequential order prerequisite to the identification, study and analysis of the underlying causative factors with which the planning process must be concerned in order to provide information for decision making which is consistent with the world of reality.

[1]Joseph Wolvek, Orientation to the Planning for Educational Priorities in Iowa Conference, Department of Public Instruction, Pub. No. 7670-840CP (Des Moines, Iowa, July 27, 1967), p. 3.

Operational Definition

Comprehensive educational planning is a process to produce valid information in the form of alternative courses of action, and consequences of such alternatives, to aid decision making by those engaged in educational policy formulation and administration of educational activities. The process should be capable of providing information relative to any educational problem input and should incorporate self renewal and updating as an essential feature.

It was important that we 'test' this operational definition with the real world environment to ascertain if it would be acceptable and, in that sense, a valid construct for effecting change, or if it would be rejected, thus barring the possiblity of operational application.

At this point, it is appropriate to indicate that the project staff attempted to validate all of the concepts which have emanated from this study. Realizing that the concepts for planning with which the study was concerned mostly dealt with non-quantifiable data, great care was taken to design tests of validity which were consistent with the logic of a research approach. This was a directed effort to keep the introduction of biased data outcomes to an absolute minimum possible.

Although the limits imposed upon the length of this report will not make it possible to illustrate how each concept was validated, it is important to offer an example of a technique utilized by the project staff which, in addition to other things, provided a validation vehicle for its operational definition of comprehensive educational planning. This example is presented in Appendix I and will serve to illustrate what is meant by "the logic of a research approach in validating non-quantifiable concepts."

The technique illustrated in Appendix I was implemented by the project staff as a contracted activity. The outcomes of this activity provided the basis for developing many of the concepts utilized in this study. The outcomes were reported in a document containing: pre and post conference reactions from individuals representing a cross section of environmental elements; six analyses, two each in political, social, and economic spheres by university men deemed by their peers to be experts in their respective fields; a summary report by a university man expert in the field of communications; and three validation reports by university men from the field of education. This and other techniques utilized in the study which provided a basis for testing concepts with elements of the real world environment (RWE) will be referred to in the remainder of this report as validity feedback looping. (See Appendix II for model indicating how the communication process may be utilized for validity feedback looping purposes in the SEA)

With regard to the project staff's operational definition of comprehensive educational planning, the outcomes of the activity reported in the aforementioned technique indicated consensus for the following points:[1]

1) The need for clarifying comprehensive educational planning is supported by the conclusion: "....'Planning' itself....is a problem term and we had better remember always that people are going to react to planning on the basis of what they conceive planning to mean. Any group involved in the planning process will have to try to give interested groups and persons some basic common meanings for these terms with which they can live."....

[1]Plan for Planning, (Appendix C), Iowa Project Unit, CPSEA, Document Index No. 2, November 19, 1967.

2) "...Although five times as many respondents were favorable to the concept of planning as were unfavorable...so we can act and not always just be reacting..." a more important indicator of the acceptance of the concept of validating information with the real world environment which is contained in the operational definition is found in the conclusion "....the success of a statewide educational planning agency will vary directly and importantly with the extent of participation by various groups in Iowa in it's development and deliberations."

3) The need for an operational definition of planning as an <u>on-going process</u> is supported by the conclusions: "...In a highly complex society, with its fantastic shading and blending of individual contributions, almost everyone has to cope with some deep psychological concerns about his significance and worth as an individual human being. A great deal of this relates to his perception of his ability to control - or, at the very least, influence - the things that happen to him and to his family. He wants, without question, the very 'best' education for his offspring - but he damn well wants to have a say in what 'best' is going to mean...a planning group in the State Department of Public Instruction would have to expect and live with a great lack of uniformity..." [out of context, but applicable], "One shouldn't be unhappy about this. If everyone were complacent about current affairs, there would be little incentive to change."

The following section of this report indicates a model for planning which was formulated within the spirit, meaning, and constraints of concepts validated in the Iowa RWE. Planning as indicated may be undertaken by a specialized planning unit or by operating divisions of the SEA, or preferably, by both.

CHAPTER II
PLANNING: FUNCTIONS, PROCESSES, TECHNIQUES

Comprehensive educational planning is an area of endeavor which concerns itself with functions, processes and techniques that operate in a different manner at each level of decision making within the SEA. This section will define functions, processes and techniques basic to comprehensive planning in general and specifically as they relate to each major level of SEA decision making.

COMPREHENSIVE PLANNING: IN GENERAL

The Planning Function

The function of a planning unit is seen within the SEA as one which does not make decisions, but instead focuses upon providing solution oriented information related to problems faced by decision makers. The range and scope of problems with which a planning unit may work is controlled on the one hand by the place of the planning unit within the SEA organizational line and staff structure, and on the other hand by the screening mechanism established for the channeling of and the ordering of priority for problem inputs assigned to the planning unit. Within these constraints planning may be directed to a variety of functions including:

1) the identification and definition of critical problems in education

2) establishing the goals of education and the new demands education must fill--for work, for living and for economic growth

3) identification of new 'tools' of education - what they are... their benefits and limitations...when, where and how to use them...where and how to obtain them

4) researching successful new educational applications to profit from the experience of others

5) charting practical action programs incorporating 1, 2, 3, and 4 above, and

6) helping to influence and implement change through: mutually advantageous and necessary cooperation between industry, education and government...sharing "know-how" and "know-what"...gaining local support and action...public information and political action...and training educators for the roles and responsibilities of leadership.

The Planning Process

As defined in the introductory section, SEA planning is acceptable as a process which focuses upon the provision of solution oriented information dealing with problem inputs provided by SEA policy and administrative decision makers. The nature of the information will vary as

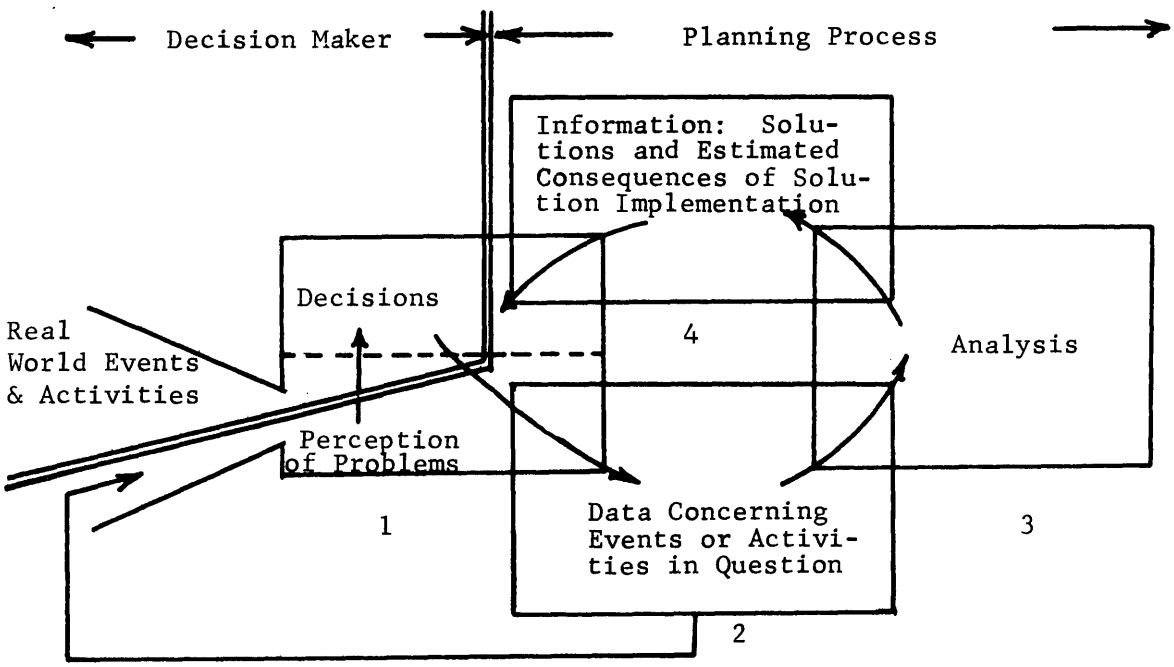

Fig. 2 - Planning Process Information Components

the nature of the problem input varies. However, the process is one which is stabilized upon the components depicted in Figure 2, with the relative degree of successful process application being dependent upon communication, the cement which holds the information components together in a cohesive, integrated, meaningfully oriented pattern.

Solution oriented information is dependent on a variety of data. The first type of data is derived from the statement of the problem input. A problem is an event or activity that occurs or develops in a manner which deviates from what is anticipated or desired by an SEA decision maker. It becomes a planning process input when SEA planners are requested to provide information that will allow decision makers to modify events or activities in keeping with what is desired or desirable. Thus, the identification of the decision maker's criteria which defines the desired or desirable, becomes data which must be considered in the provision of solution oriented information.

The second type of data is derived from the events or activities in question. Such data is processed in the attempt to identify events or activities as they are in reality. This is important in providing a base of information relative to what is now. It is at this point that the decision maker may be informed concerning erroneous assumptions that may have been made relative to the events or activities in question. If such is the case the planning process cycle may terminate for the given problem input. However, if it is found that an erroneous assumption has not been made, the base of data derived provides a logical prerequisite for providing information in the next phase of the planning process.

The next phase in the planning process provides information derived from a system analysis of the elements relating to the problem. This

analysis utilizes the experience and professional expertise of planners, as well as research methodology and a variety of planning techniques oriented to the production of synthesized information. This information is reported in the next phase of the process in the form of:

1) a variety of solution alternatives stated as strategy, functions, tasks, methods, means, and performance necessary to redirect events or activities in keeping with what is desired or desirable and,

2) the estimated potential effectiveness and cost, in the broad sense, of each solution alternative.

Planning Techniques

In general, planning techniques can be considered to consist of:

1) research methodology models and statistical tools focusing upon sequentially interdependent parameters to be considered in problem analysis, such as systems analysis and systems synthesis models provide (See Appendix III),

2) ways by which information derived from problem analysis may be validated. These may range from validity feedback looping with elements in the real world environment for one type of problem, to the utilization of activity or event networks to monitor achievements in the flow in time for another type of problem, and

3) the skill with which planners, by virtue of education, experience and intellegence, are capable of a) utilizing planning tools, b) identifying significant elements related to a given problem, c) establishing rapport and communications with decision makers and others, and d) providing training in the use of planning techniques to professional personnel in the SEA.

This last point, providing in-service training in planning to the SEA professional staff, is an essential technique. The criterian stated earlier,..."From the viewpoint of feasibility and efficiency it is desirable for each major level of organization, i.e., local school district, intermediate school structure, area school district, SEA, regional multi-state, and U. S. Office of Education to develop planning units designed to cope with the variety of problems encountered at each respective level."...may be extended to apply to the various levels of operation within each of the major levels of organization. We do not mean to imply that each operating level of an organization should develop a comprehensive planning unit. What we do mean is, that planning is enhanced, the closer it is carried out to the level of organization at which a given problem exists. For this reason, in-service training in planning within the SEA is in itself a planning technique utilized by a planning unit and oriented to: efficiency of agency operations, establishing SEA in-house communications networks based upon similar technical language and concepts, and reducing the overall number of problems directed to the planning unit, allowing it to concentrate upon complex priority problems which by their nature may require an intra-SEA coordinated planning process effort.

Whether a problem falls within the scope and extent of the function of the SEA planning unit will be determined sequentially by,

1) the desire of a decision maker to refer a given problem to the planning unit,

2) the channels established by the hierarchy of decision makers to screen problems for referral to the planning unit, and

3) the priority weighting established for a given problem by the hierarchy of SEA decision makers.

But, whether a problem is identified as an input for the SEA comprehensive planning unit, or if identifying solutions to problems is undertaken as a planning function of the subdivisions of the SEA, planning should be sensitive to the type of problem under consideration so that the function, processes and techniques of the planning undertaken will be pertinent to the solutions which are required.

COMPREHENSIVE PLANNING: AS SPECIFICALLY RELATED TO THE MAJOR LEVELS OF SEA DECISION MAKING

As defined in the introductory section, comprehensive planning focuses upon the provision of solution oriented information which deals with problem inputs provided by SEA policy and administrative decision makers. The nature of planning functions, processes, and techniques will vary as the nature of the problem input varies. The project staff concurs with Anthony's analysis of problem input types.[1] We believe that any problem that can occur in the total range of SEA decision making may be included in one of the following catagories:

1. Strategic planning problems.
2. Management control problems.
3. Operational control problems.

Decision makers are ultimately responsible to the real world environment (RWE) for the consequences of their decisions. The degree of this responsibility to the RWE increases in direct ratio with the level of decisions that are being made--ranging from operational control decisions

[1]Anthony, Robert N., Planning and Control Systems, A Framework for Analysis. Boston: Harvard University, 1965.

at the lower end, to strategic planning decisions at the upper end of the continuum. Figure 3 indicates how SEA problem categories and comprehensive planning may be pictured to show mutual interdependency within the RWE.

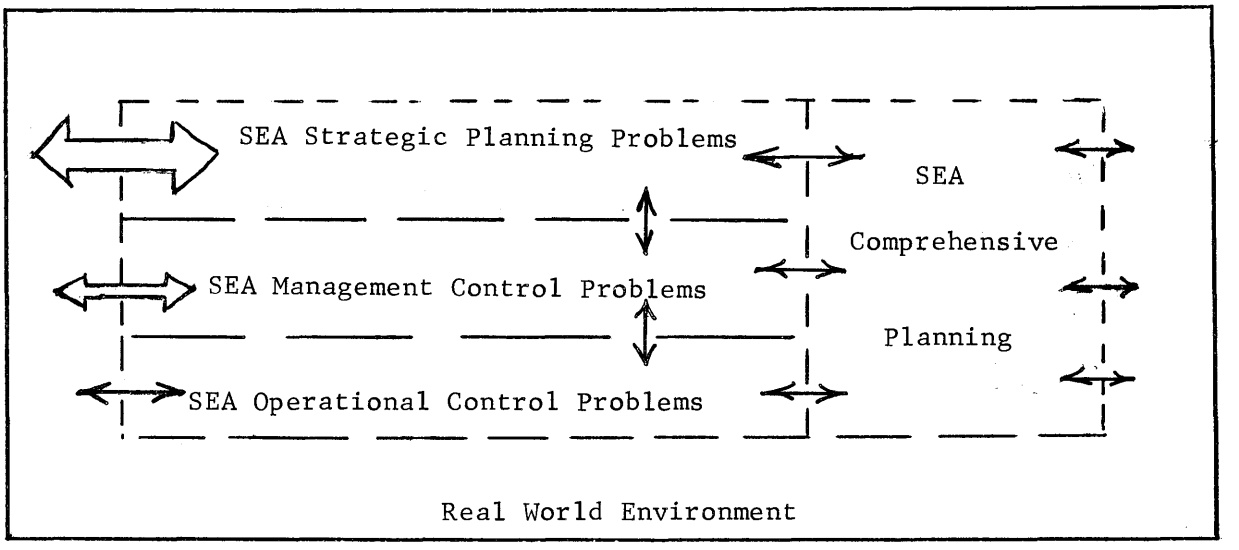

Fig. 3 Interdependency of SEA Problems and Comprehensive Planning Within the Real World Environment.

Strategic Planning Problems: The Comprehensive Planning Function

Strategic planning problems in the SEA originate primarily from the need for activities directed to identifying worthy goals of education and the policies which may be formulated as a result. In a democracy, the worthiness of educational goals and derived policies is determined by their impact upon and acceptance by society, the real world environment. Traditionally, strategic planning information has been difficult to obtain with validity because of the highly complex nature of the American society and the voluminous, often scrambled demands eminating from the socio-psychologic needs of individuals in the society, and the ethnic, social, economic, and political sub-stratifications of society in which individuals at times group and regroup themselves.

The function of comprehensive planning at the strategic planning problem level is maintaining integrity with the real world environment. This function may be expressed as the conditional statement:

$$D_r = G_w \Rightarrow I_r = V\left[G_w\ (RWE)\right]$$

Interpretation

If a decision is required (D_r) which must identify worthy goals (G_w) for the SEA to adopt, then the information required (I_r) by the decision maker must be valid (V) in terms of the effects of such goals upon the real world environment (RWE).

$D_r = G_w$ is the responsibility of decision making. $I_r = V\left[G_w\ (RWE)\right]$ is the responsibility of comprehensive planning. I_r being equivalent to synthesized planning solutions and $V\left[G_w\ (RWE)\right]$ being equivalent to estimated consequences of solution implementation. $G_w \Rightarrow I_r = V\left[G_w\ (RWE)\right]$ delineates the scope within which the planning process must operate.

It should be noted at this point that specific G_w's for education may be derived from the RWE for the present, for the near and anticipated future, or for the relatively distant future. The planning process at this level of problem solving will be oriented not only to identifying such RWE desires as short range, intermediate range, and long range G_w's, but, in addition, will provide information relative to RWE priority values of G_w's within each of these time range catagories. As such, it would be quite legitimate for planning at this

level to process problem inputs directed to the identification of short range, or intermediate range, or long range G_W's.

Strategic Planning Problems: Comprehensive Planning Process and Techniques

The planning process at this level stems from a systems research approach which, broadly stated, consists of:

1) identifying and projecting educational needs

2) clarifying and quantifying educational objectives

3) delineating alternative uses of resources to attain objectives

4) estimating potential effectiveness and efficiency of each alternative

5) integrating all functions of the educational system into an internally consistent plan of action, and

6) recommending an optimum plan for administrative action

However, to be effective, the process cannot depend upon the armchair deductions or assumptions made by planners. The conditional statement of the planning function specifies the manner in which systems analysis should be executed.

The main focus of the SEA planning process at the strategic planning problem level is derived from the G_W term of the functions statement: to what extent can it be demonstrated that existing or projected specific goals, policies, and objectives of the educational system are relevant to the persistent and compelling social, cultural, and economic problems of the state.

The degree to which this focus can be maintained by the planning process, indicated by the terms $I_r = V\left[G_W\ (RWE)\right]$, will be dependent upon

the ability of planners to maintain sensitivity to the perception of problems and to estimate RWE reaction to solution oriented information in the form of alternative solution consequences. The techniques for implementing the planning process at this level should involve elements of the RWE in two-way communications concerning:

1) the generation of alternative possible goals

2) explanation of possible alternative goals and related data

3) public dialogue concerning the alternative goals, methods/means strategies to achieve them and their possible consequences.

4) public participation in the selection of desired goals and acceptance of strategies to achieve them

5) a feedback validity looping network to ascertain goal attainment and signal the need for corrective measures to be taken in time to affect desired outcomes.

The information derived from this technique constitutes the primary source of data inputs for the planning process.

The elements of the RWE selected should be as broadly representative of the public as possible as may be ascertained from the specific nature of the strategic planning problem, whether it be stated in the form of worthy goals, policies, objectives or other concreta.

A partial listing of the RWE elements which operate in the political, social and economic spheres in Iowa identified as a result of a study conducted by the project[1] is as follows:

Federal Government

Department of Agriculture

Office of Economic Opportunity

Youth Corps

[1] Op. Cit., Plan for Planning, (Appendix C)

Department of Health, Education and Welfare

Department of Housing and Urban Development

Iowa State Government

Board of Control

Board of Social Welfare

Chairmen and ranking minority member of each of the education committees of the legislature, or the entire complement of both committees

Chairmen of state central committees of both parties

Civil Defense State Office

Commission for the Blind

County Chairmen of both parties

Department of Public Instruction

Executive Council of the state consisting of: the Governor, the Lieutenant Governor, Secretary of State, State Treasurer, State Auditor, Attorney General, Secretary of Agriculture

Higher Education Facilities Commission

Iowa Development Commission

Iowa Employment Security Commission

Iowa Legislative Research Bureau

Iowa State Department of Health

Iowa State Employment Service

Majority and minority leaders of both houses

Manpower Development Council

National committeemen and women of both parties

Speaker of the Iowa House, President of the Iowa Senate

State Coordinator of Federal Funds

State Department of Social Welfare

Occupational Organizations

AFL-CIO, United Auto Workers, Teamsters, and the American Federation of Teachers

American Association of University Professors

Chamber of Commerce and Junior Chamber of Commerce

Iowa Association of College Presidents

Iowa Farm Bureau

Iowa Manufacturers Association

Iowa Medical Society

Iowa Ministerial Association

Iowa State Bar Association

Mass communications media: Press and news services, etc.

National Farmers Organization

National Farmers Union

Other Organizations

Alcoholics Anonymous

American Association of University Women

American Friends Service Committee

American Legion

American Red Cross

Boy Scouts of America

Camp Fire Girls

Child Guidance Center

Girl Scouts

Iowa Association for Mental Health

Iowa Association for Retarded Children

Iowa Children's Home Society

Iowa Civil Liberties Union

Iowa Council on Alcoholic Problems

Iowa Council of Churches

Iowa Council on Family Relations

Iowa Good Roads Association

Iowa Society for Crippled Children and Adults

Iowa Taxpayers Association

Iowa Welfare Association

Jewish Social Service

League of Women Voters

National Association for the Advancement of Colored People

National Catholic Rural Life Conference

National Conference of Christians and Jews

National Urban League

Planned Parenthood Association

Rotary, Kiwanis, Lyons and other service clubs

Veterans of Foreign Wars

Women's Christian Temperance Union of Iowa

Women's Federated Clubs

Young Men's Christian Association

Young Women's Christian Association

Youth Opportunity Center

Public Employee Organizations

City Managers Association

County Officers Association

Finance Officers Association

Iowa High School Athletic Association

Iowa Public Health Association

Iowa Public Welfare Association

League of Iowa Municipalities

Educational Organizations

Advisory Council and the Coordinating Committee for the Improvement of Education in Iowa

Iowa Association of Adult Education

Iowa Association of County Superintendents

Iowa Association of Private Colleges and Universities

Iowa Association of School Administrators

Iowa Board of International Education

Iowa Congress of Parents and Teachers

Iowa Council for Better Education

Iowa Educational Conference Board

Iowa Elementary Principals

Iowa Public School Adult Education Association

Iowa School Board Association

Iowa Secondary Principals

Iowa State Educational Association

National Educational Association

North Central Accrediting Association

Representatives from the community colleges

Representatives of school districts using a sample based on a matrix of type of district (independent, community, consolidated) and size of enrollment, size of staff, and location (rural-urban)

Representatives from the various parochial school systems, in-

cluding the Amish, Bureau of Jewish Education, Roman Catholic Archdiocese, etc.

State Board of Regents

Strategic Planning Problems: Estimating Consequences of Alternative Solution Oriented Information

Prior to decision making

A number of alternative G_w's may be "trial-tested" in the RWE communication network to indicate the kind and degree of RWE reaction for each. The "testing methods" may take any of a number of forms chosen for appropriateness by conditions at the time of "test", and for the information required. More than twenty "testing methods" are reported by P. E. Rosove in A Provisional Survey and Evaluation of the Current Forecasting State of the Art for Possible Contributions to Long-Range Educational Policy Making.[1] Since this survey is not as yet cleared for open publication, suffice it to say that the methods reported may be utilized for a number of purposes ranging from monitoring "noise" produced in the general RWE system as a result of reaction to alternative G_w information, to the establishment of structured validity feedback loops with a representative sample of elements within the RWE. This latter utilization would require weighted evaluations to be made for a number of alternative G_w's.

Following decision making

1) The actual reaction of the RWE system may be assessed and

[1]Tech Memo 3640/000/00, a document produced in performance of contract OEC-1-7-071003-4275, Department of Health, Education and Welfare, Office of Education, by Systems Development Corporation, Santa Monica, California, August, 1967.

compared to intellegence gathered during the pre-decision making period. This would indicate the degree of accuracy which might be anticipated at future times for the method(s) of estimating consequences utilized in the planning process.

2) Quantitive or qualitive outcomes of G_w's resulting from decision making may be evaluated in terms of attainment of the pre-specified desires of the RWE. This may provide the basis for developing a quality yardstick for measuring education parameters.

3) Decisions for strategic planning problems based upon information developed within this planning process will stand a greater chance of being formulated with:

a) an understanding of the level of cooperation or opposition to be anticipated from elements within the RWE system and,

b) an understanding of the degree of priority (anticipated pressure) from elements within the RWE for the attainment of specific goals.

Management Control Problems: The Comprehensive Planning Function

Given relevant goals to pursue, the problems which confront decision makers at the SEA management level, center upon to what extent can these goals be attained by the SEA system. The major function of comprehensive educational planning at this problem level is to provide alternative solution oriented information to SEA administrators which will aid them in making decisions relating to management strategies for the programming, implementation and control of activities required for goal attainment within the existing or anticipated constraints of SEA resources, time, and performance capacities.

The function of comprehensive planning at the management control problem level is one of supporting decision makers in the formulation of management strategies for goal attainment within imposed constraints of resources, time and performance. This function may be expressed as the conditional statement:

$$D_r = A_{G_w} \rightarrow I_r = E_{PIC}\left[\frac{(RTP)}{S_m}\right]$$

Interpretation

If a decision is required (D_r) which must attain worthy goals that have been identified (A_{G_w}), then the information required (I_r) by the decision maker must be in terms of how SEA management strategy for goal attainment (S_m) can most efficiently program, implement and control (E_{PIC}) the utilization of limited resources, time and performance (RTP). The relationship of S_m to the limited RTP is expressed as a fraction. The better S_m's are formulated to operate within limited RTP, the more efficient will be the attainment of goals. It should be noted that the conditions of RTP are not constant. This implies that S_m must be capable of changing as RTP conditions change. Therefore, planning at this level should be a continous process directed to the provision of up-to-date solution oriented information and not fixed information which is at times reported in the form of long-range plans.

Management Control Problems: Comprehensive Planning Process and Techniques

Some aspects of planning to support the development of management strategies are similar to the development of information at the strategic planning problem level. This is an essential overlap and insures that information provided to support management strategy development will be

consistent with the goals and policies of the SEA that were derived from the RWE. Therefore, the planning process at the management control problem level will focus upon:

1) identifying and projecting educational needs within the goals for education established by the SEA;

2) deriving preliminary management strategies by clarifying and quantifying educational objectives leading to SEA goal attainment and allocating functions and tasks necessary to attaining objectives;

3) delineating alternative methods and the means for operationalizing each in the form of resource, time, and performance requirements in order to identify the most efficient use to be made of RTP in the attainment of objectives;

4) estimating potential effectiveness and efficiency of alternative management strategies by techniques ranging from field tests or pilot studies for some management control problems to the establishment of validity feedback loops with elements within the SEA and RWE for other types of management control problems;

5) integrating all related functions of the educational system into an internally consistent plan of action that would be recommended as an optimum plan for the decision maker to implement; and

6) following the decision maker's choice regarding the plan of action to be taken, to provide information for the establishment of management and control subsystems prerequisite to evaluating and when necessary, revising the plan of action as a result of monitoring the relationship of outcomes to goals.

The techniques of the comprehensive planning process at this problem level operate in the major areas of securing valid data inputs relevant to the objectives which may be identified in management strategies leading to the attainment of SEA goals and, developing an efficient intra-SEA communication network which can provide both information and coordination to involved operating divisions of the SEA.

Sources of securing planning data inputs, in addition to elements of the RWE mentioned earlier, include:

Planning units of other agencies or branches of State Government,

the Governor's Office for Planning and Programming

the Comprehensive Planning Unit of the State Department of Health

The broad scope of projects producing specialized educational data,

the Midwestern States Educational Information Project

the Great Plains Project for Local School District Organization

the Elementary-Secondary Study of Education in Iowa

the State-Wide Plan for Vocational Rehabilitation Services in Iowa

the network of regional education laboratories now operating across the nation (Upper Midwest Regional Education Laboratory, etc.)

the National Center For Educational Statistics

Technical planning units of other state or regional education agencies

Use of Special Models

A special area of focus which may require solution oriented information from the SEA comprehensive planning unit at this problem level is

how to sensitize the political and administrative processes underlying the educational system to needed change as may be indicated from the identification of desired or desirable educational goals. This type of solution oriented information may deal with problems encountered in the state legislative program, particularly its policy enactments and funding programs, as well as the executive action programs, both at state and local levels. A planning model to indicate how such solution oriented information may be generated is reported in Appendix IV. The model makes use of the communication networks established between the SEA and RWE to relate data inputs in the form of information from the RWE to the identification of the kind of management strategies leading to SEA goals.

Management Control Problems: Estimating Consequences of Alternative Solution Oriented Information

Prior to decision making

A number of S_m's may be tested in the RWE system, and with SEA decision makers who operate at the strategic planning problem level, to indicate the relative degree of acceptance for each. The same logic and methods for "testing" G_w's may be used in "testing" S_m's.

Following decision making

1) The actual reaction of elements within the RWE system and of strategic planning decision makers in the SEA may be assessed and compared to intelligence gathered during the pre-decision making period. This would indicate the degree of accuracy which might be anticipated at future times for the methods of estimating consequences utilized in the planning process.

2) Outcomes of decisions based upon information produced in the comprehensive planning process at this level can be evaluated to determine if they are: consistent with need, and the degree to which goal oriented objectives have been attained in terms pre-specified by elements within the RWE and SEA.

Operational Control Problems: Comprehensive Planning Function

Given relevant management strategies for goal attainment within identified constraints of resources, time, and performance, problems at the operational control level focus upon to what extent can the educational system be efficient while achieving the principle objectives? To what extent are resources used optimumly? To what extent are individual pupils benefiting from educational programs, services, and organization?

The function of comprehensive planning at the operational control problem level is one of supporting decision makers with information required to maintain ongoing activities within constraints imposed at the management control and strategic planning levels. This function may be expressed as the conditional statement:

$$D_r = A_{S_m} \Rightarrow I_r = T_O \left[(F_{rtp}) \ (R) \ (A) \right]$$

Interpretation

If a decision is required (D_r) which must specify SEA activities leading to the attainment of management strategies (A_{S_m}), then the information required (I_r) by the decision maker must be tactically operational in terms of the following three factors: feas-

ibility, the basic components of which are resources, time, and performance (F_{rtp}); responsibility (R) and authority (A).

When it is necessary to involve a number of operational divisions of the SEA to implement a management strategy, the (R) and (A) factors may be complex. If the nature of this complexity causes confusion, it may seriously effect the (F_{rtp}) factor. The responsibility and authority to allocate resources and prescribe time and performance are essential to carrying out operations. It is for this reason that each of the three factors are equally weighted in the statement of conditions affecting the information required by the decision maker.

Operational Control Problems: Comprehensive Planning Process and Techniques

One of the major purposes of comprehensive educational planning in the SEA is to provide operational control information to administrators in charge of supervising the day-to-day SEA activities designed to achieve objectives in keeping with management strategies for SEA goal attainment.

There are two ways a planning unit may accomplish its purpose in this area. The first is to provide in-service training in planning techniques for SEA operational control administrators. Such techniques would focus upon: a) developing systems analysis expertise, for the purpose of clarifying SEA policies and management strategies and deriving administrative authority and responsibility therefrom and, b) developing expertise in techniques relating to the management of personnel performance, resources, and time in operations directed to the attainment of objectives.

A second way in which a planning unit may accomplish its purpose in this area is to help administrators develop complex systems analyses

and identify methods/means analyses for the units of work involved in terms of personnel, time, and resources. In this instance, the planning unit's role would be to provide the expertise in the planning process technique. It would draw on the expertise of involved SEA personnel for knowledge of tactical requirements as a main source of data inputs.

In anticipation of implementing this latter function and as a means of pilot testing some of the concepts contained within the planning process just described, the project unit surveyed some of the available tools of systems approaches to planning. Project Evaluation and Review Technique and Critical Path Method networks were found to be sufficiently developed for educational application for the planning process described in this report. The unit then initiated the collection of a data bank of inputs relating to time factors and job performances. The inputs for this data bank were collected as a result of individual interviews conducted with the personnel from a number of SEA operating divisions.[1]

A major product of these interviews was the cataloging of expert opinion regarding the nature of operational activities in which the interviewees engage, and based upon their experience, the time it takes to accomplish each.

This information was transferred to cards filed in a triple index system for manual retrieval as the need for this information might be required in developing project evaluation and review technique (PERT) networks for use by SEA administrators responsible for operations. (See Fig. 4)

[1]Limited project time did not allow for interviews with all SEA personnel or of the collection of cost data. These are scheduled for the near future.

Next, decision makers in charge of operations in the divisions surveyed were asked to supply the planning unit with an operations control problem input. In cooperation with division personnel responsible for carrying out the activities to which the problem input was addressed, the unit helped to draft a systems analysis indicating the objectives, and tactics of each, which were required in the solution of the problem. From an analysis of the units of work involved in achieving each objective, and from an analysis of the interdependency of objectives, a PERT network was drawn. A computer program which the SEA's Data Processing Division could utilize with their equipment was selected.[1] The units of work (jobs) and expected elapsed time (Te) for each were entered on data cards designed for the program (See Fig. 5). The information from these cards was keypunched into a data deck which was processed with the computer program. The computer print output provided information which was used to complete the PERT network in a manner suitable for administrative decision making at the operational level. This data included:

1) preceding and succeeding event numbers for each job (activity)

2) a listing of jobs in a predetermined desired order of sequence (sort code)

3) activity duration (Te) of each job

4) cost for each job *(See No. 11)

5) early and late start time constraint limits for each job

6) early finish and late finish time constraint limits for each job

7) total float, which is dependent on starting a job on the early

[1]Critical Path Scheduling with Arbitrary Node Numbering for the 1401, 10.3.019 (4k), 10.3.020 (8k), IBM 1401 General Program Library.

start time. It indicates slack time which can be used without affecting any succeeding jobs

9) independent float, indicating free float remaining if a job is started at its late start time

ACTIVITY _____

POSITION TITLE _____

DPI UNIT _____

DESCRIPTION OF ACTIVITY _____

EXPECTED ELAPSED TIME (t_e) _____

a. Optimistic time (a) _____

b. Most likely time (m) _____

c. Pessimistic time (b) _____

Fig. 4 Manual Retrieval Index Card for SEA Operational Activities and Expected Elapsed Times.

10) jobs which are on the critical path of the network

11) total cost of achieving solution to the problem as conceived in the systems analysis and in terms of jobs included on the PERT network. *(Data inputs for cost were not utilized in the trial runs which were conducted, however the program was selected for its capacity to utilize such data when it is developed as a data bank by the SEA planning unit.)

12) total duration of time of the jobs

13) total number of jobs

14) Number of jobs on the critical path. Critical path is defined as the longest time sequence of activities (jobs) and events from the

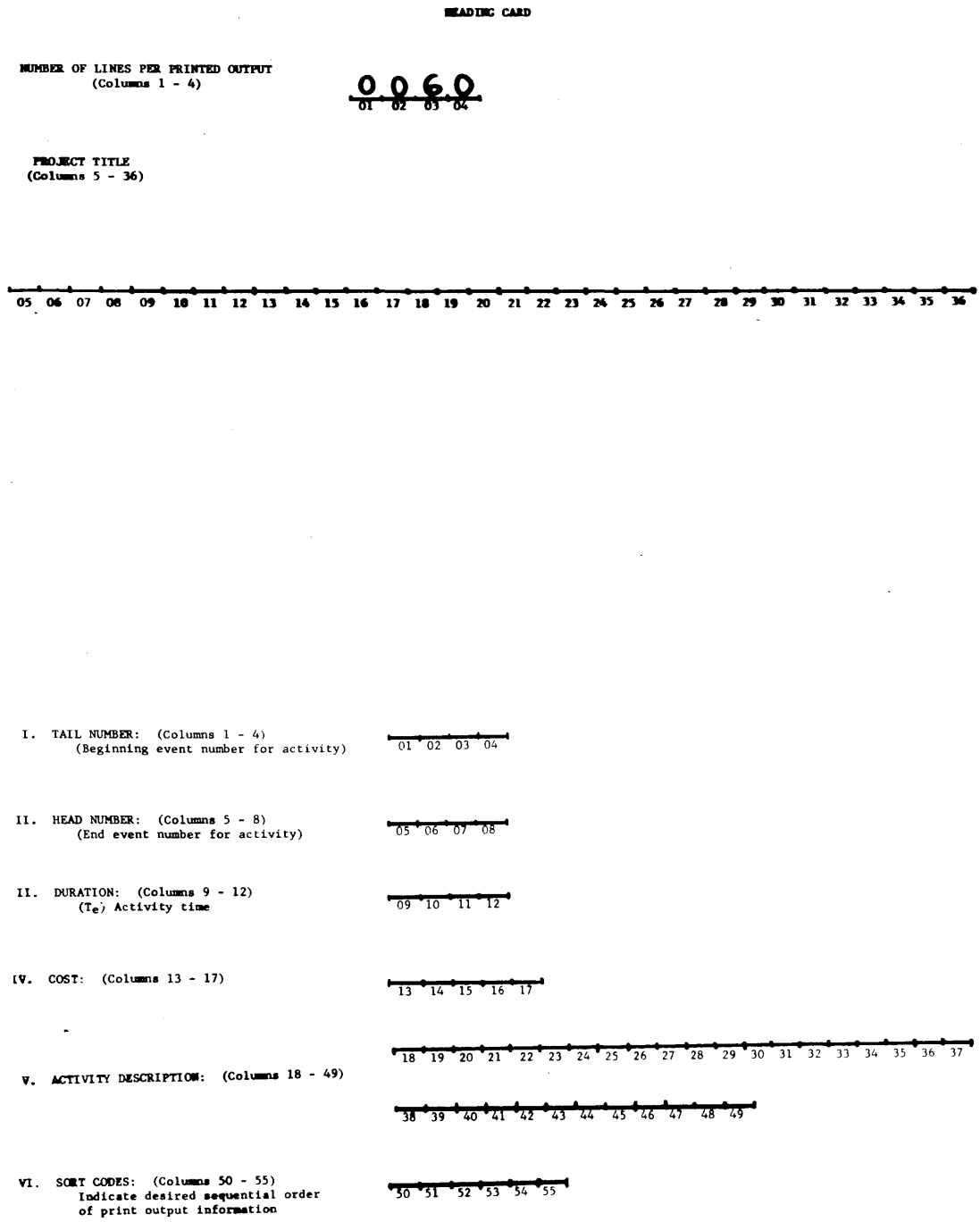

Fig. 5. Data Cards Designed for Computer Application in Providing PERT Network Information

beginning of the network to the end.

Utilizing the data cards (See Fig. 5) will allow, either the decision maker of the SEA planners when called upon to do so, to update operational information as it is needed. For example, if, during the course of conducting SEA activities on the operational level, conditions change to make information pertaining to a job no longer valid, the data card for that job can be replaced with a data card containing updated information. This card can be quickly key punched, added to the other cards in the data deck in the sequence desired, and the entire deck re-processed for a print output that will show the effects it will have on operational activities (jobs) and events leading to the achievement of the end objective or solution.

There are other techniques for modifying PERT network information as the need to do so arises. By utilizing the technique above, when it is appropriate to do so, updated operational control information can be provided within the hour of the time that the need for it is discovered. This is an important criterian for a planning process at the operational control problem level, where the contingency for solution oriented information is needed on a right here, right now basis.

Operational Control Problems: Estimating Consequences of Alternative Solution Oriented Information

Prior to decision making

The utilization of the systems approach in providing solution oriented information at the strategic planning problem and management control problem levels of decision making provides the data inputs necessary to obtaining information relating to the following:

1) the identification of anticipated desired outcomes, to help insure that the operational activities are consistent with the goals of the SEA,

2) the identification of objectives, to help insure that operational activities are consistent with SEA management strategies, and

3) the identification of tactical operational activities related to 1) and 2) above, and administrative responsibility and authority for each.

These in turn provide the necessary data inputs for developing administrative operational control tools, such as PERT networks, to help focus upon decisions which have to be made to control and direct the expenditure of resources, performance, and time during the conduct of operational activities.

Following decision making

The pattern and structure of activities may be analyzed in a number of ways:

1) pre-decision performance criteria may be compared with demonstrated performance by those engaged in SEA activities,

2) the extent to which identified objectives were achieved may be determined,

3) the extent to which identified management strategies were fulfilled may be determined, and

4) SEA goal attainment may be determined through an assessment of RWE behavorial changes which would indicate the extent to which a needs-satisfaction of elements in the RWE was accomplished.

CONTROL

The comprehensive planning process at the strategic, management, and operational problem levels as outlined in this section can be utilized by a comprehensive planning unit as a powerful and effective research tool to provide SEA decision makers with the means to achieve SEA ends. As a process at the management and operational levels it can be utilized effectively regardless of SEA goals. Therefore, to help insure that the ends to which this planning process may be utilized by a comprehensive planning unit remain in the public interest, it is important that appropriate controls be instituted.

We believe planning process control may best be achieved if the role of those engaged in the SEA planning unit is divorced from SEA decision making. The role of planning unit personnel should be limited to providing valid information for use by decision makers who must assume responsibility for the decisions which they make. Establishing an SEA organizational structure by which SEA decision makers' problem inputs may be screened for appropriateness prior to submission to a planning unit is a desirable means for implementing control, because in addition to safeguarding the RWE from a possible condition in which the means may justify the ends, it forces the establishment of intra-SEA communication networks for channeling of solution oriented information through the policy, management, and operations levels of SEA decision making. Establishing such an SEA organizational structure for planning is the focus of the following section.

CHAPTER III
STRUCTURE

The place of a planning unit within the SEA organizational structure, as well as the organizational structure of the unit, may limit or enhance its ability to function in the provision of solution oriented information for the full range of problems which may be directed to it. From the description of the planning functions, processes, and techniques in the preceding section, it will be noted that the information that may be produced by a planning unit may at times be provided to SEA decision makers serving in line positions or in staff positions. In order to operate in such a fashion, with the required degree of flexibility and authority the personnel within the planning unit should hold staff positions.

This section will explore how the present SEA organizational structure and the place of the present planning unit in it (See Fig. 1) may be utilized in establishing the channeling of problems, and identification of problem level, to provide a basis for designating priority for individual problem inputs.

Utilizing the SEA Structure for Planning

The first step in channeling a problem input to the planning unit is the desire of a decision maker to do so. The organization chart indicating SEA line of authority as shown in Fig. 1 and as further exemplified in Fig. 6, may be utilized as the channel for submitting problem inputs to the planning unit. Such channels, if utilized in all operating divisions of the SEA will insure that:

1) identification of and communication concerning specific problems takes place between the operation, management, and policy levels of SEA administrators,

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ORGANIZATION CHART FOR
ADMINISTRATIVE SERVICES BRANCH

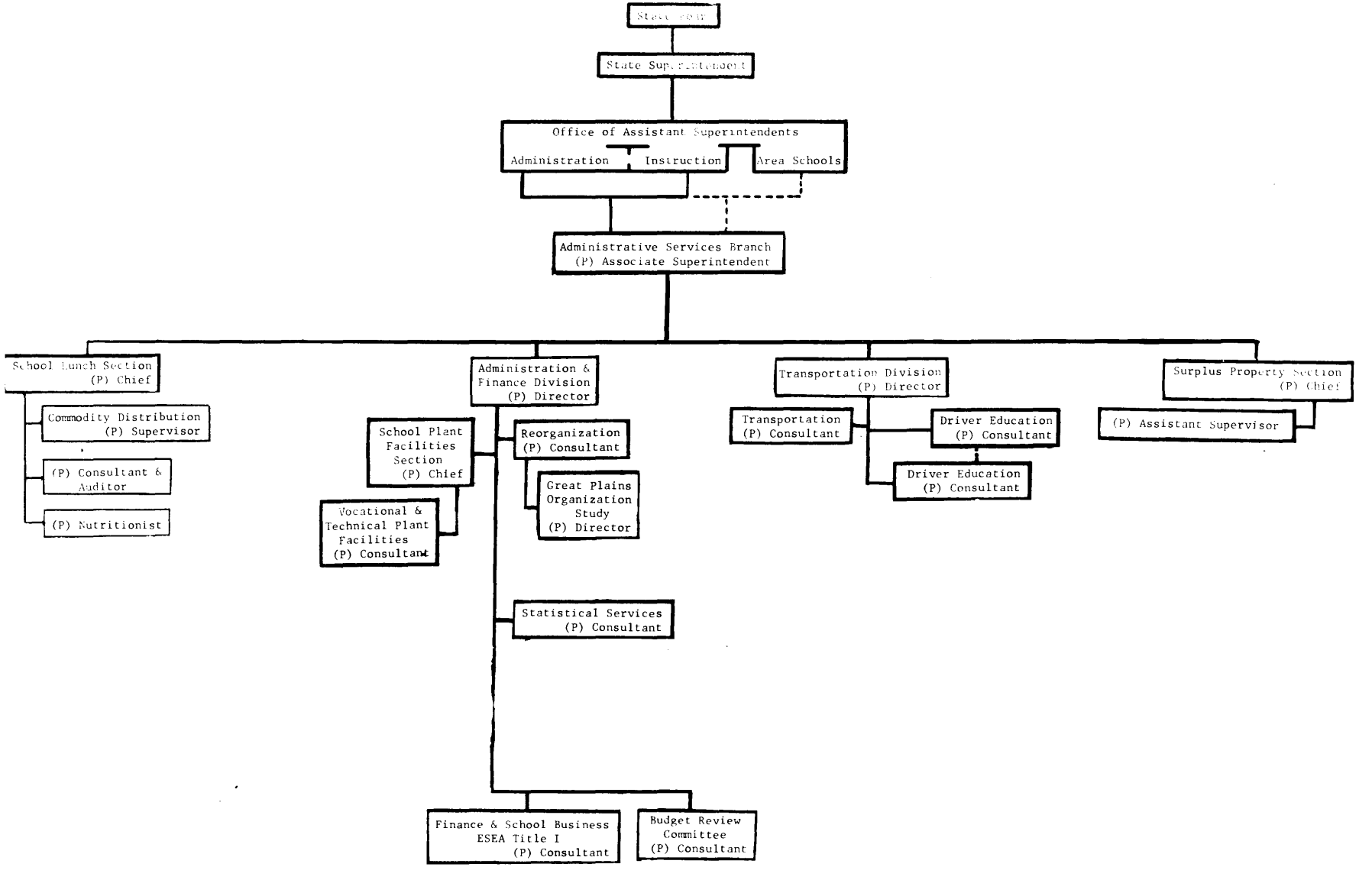


Fig. 6 Organizational Structure: Department of Public Instruction, Administrative Services Branch Professional Positions

2) the initial decision to submit a problem to the planning unit takes place at the closest point in the organization where the problem occurs, and

3) the decision to submit a problem input to the planning unit is screened and controlled by the existing hierarchy of SEA administrators which may, in the course of channeling, redesignate it to what may be considered to be an appropriate problem input level, regardless of its level of origin.

Operational problem inputs, the sources of which may originate from line positions exemplified in Fig. 6, would be first submitted to management level administrators indicated by the associate superintendent positions in Fig. 1. A number of options are available to the associate superintendent as indicated in Fig. 7. One, he may supply the required solution oriented information and refer the problem and solution back to its origin. Two, he may wish to transmit the problem to the comprehensive planning unit, add information in the form of his perceptions to the initial problem input, specify individuals within the operational division with whom members of the planning unit may work in developing solution oriented information, and specify the channels for the return of planning unit solution oriented information. Three, he may see the problem input as an element of a larger problem, perhaps operating on the management control level.

Management problems which might be considered as inputs for a planning unit would first be submitted for screening to the cabinet. In the Iowa SEA, the cabinet is composed of all associate superintendents and the three assistant superintendents. The role of the cabinet is twofold. First it acts as a policy making group for the management and

operational organizational levels of the SEA and policies are implemented through the Office of Assistant Superintendents. Second, it serves as an advisory group to the state superintendent for strategic planning problems.[1] The cabinet may excerise a number of screening options as depicted in Fig. 8. One, it may supply the required solution oriented information and refer the problem with its solution back to its origin. Two, it may wish to transmit the problem to the comprehensive planning unit, add information in the form of its perceptions to the initial problem input, specify individuals or task force groups within the branches and divisions with whom members of the planning unit may work in developing solution oriented information, and specify the channels for the return of the planning unit solution oriented information. Three, it may see the problem input as an element of a larger problem, perhaps operating at the strategic planning problem level.

Strategic planning problems which might be considered as inputs for the planning unit might originate: in the SEA cabinet, in the Office of Assistant Superintendents, or with the State Superintendent as a result of needs as perceived by himself or by the State Board of Public Instruction. Strategic planning problem inputs originating in the cabinet, Office of Assistant Superintendents, or State Board of Public Instruction would first be submitted for screening to the State Superintendent. A number of options are available to the Superintendent as indicated in Fig. 9. One, he may supply the required solution oriented information and refer the problem and solution back to its

[1]Minutes of the Meeting of the State Board of Public Instruction, April 22, 23, 1965, pp 4-5.

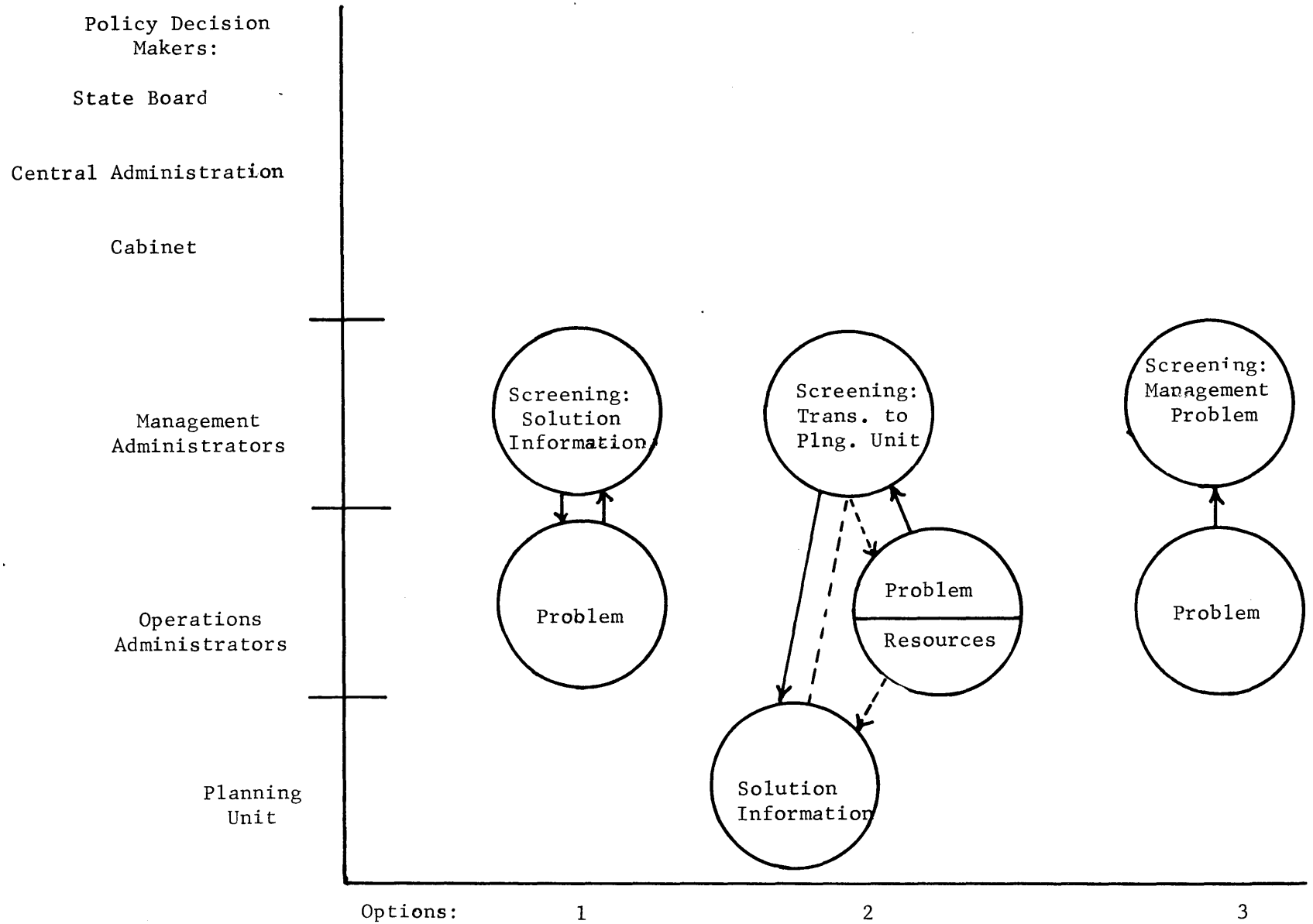


Fig. 7 Channeling Problem Inputs Originating at the Operational Control Problem Level.

origin. Two, he may wish to transmit the problem to the comprehensive planning unit, add information in the form of his perceptions to the initial problem input, specify individuals within the SEA with whom members of the planning unit may work in developing solution oriented information, provide information concerning elements of the RWE which are involved in the perception of the problem, and specify the channels for the return of planning unit solution oriented information.

This method of channeling problem inputs to the planning unit utilizes the existing SEA structure to identify each problem, assign its problem level, and specify the channels for the return of solution oriented information. It also makes use of the existing SEA structure to assign priority to the problem inputs should the work load of the planning unit exceed its available resources. If this situation develops, top priority will be given to strategic planning problem inputs, then to management control problem inputs, and lastly to operational control problem inputs. Although this method for establishing channels for the services of the planning unit requires it to be under the direct administrative purview of the state superintendent, the method insures that the SEA planning unit will be sufficiently divorced from decision making so as not to pose a real or assumed threat to the SEA operating divisions. As Eide points out, "This may be worthwhile noting for those who fear that in the future, over-ambitious planners will gain too much control of policy matters.[1]"

Organizational Structure of the Planning Unit

Fig. 10 depicts the present organization of the SEA Planning, Develop-

[1]Eide, Kjell, The Planning Process, Phi Delta Kappa, Symposium on Educational Planning, University of Minnesota, November, 1967.

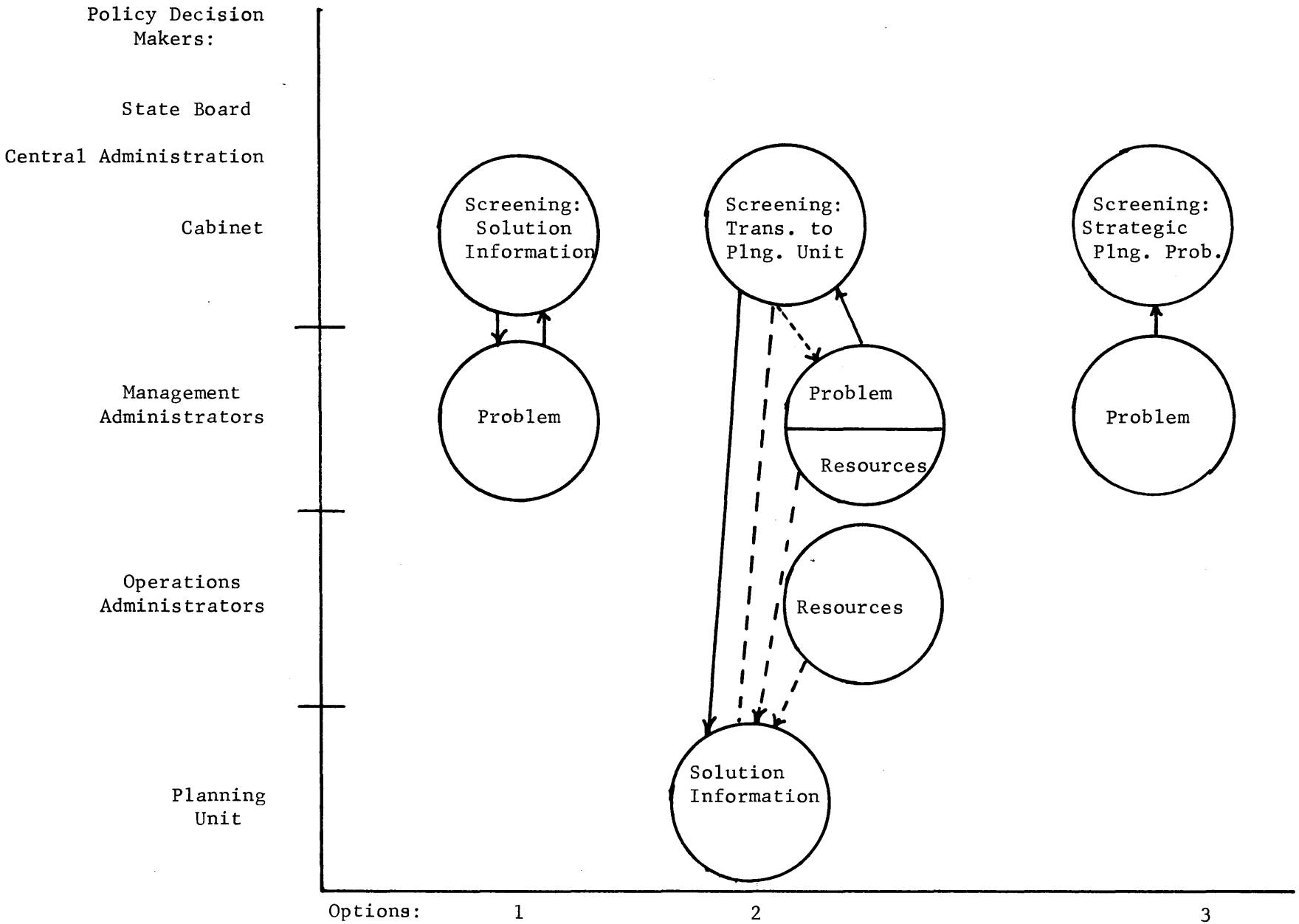


Fig. 8 Channeling Problem Inputs Originating at the Management Control Problem Level.

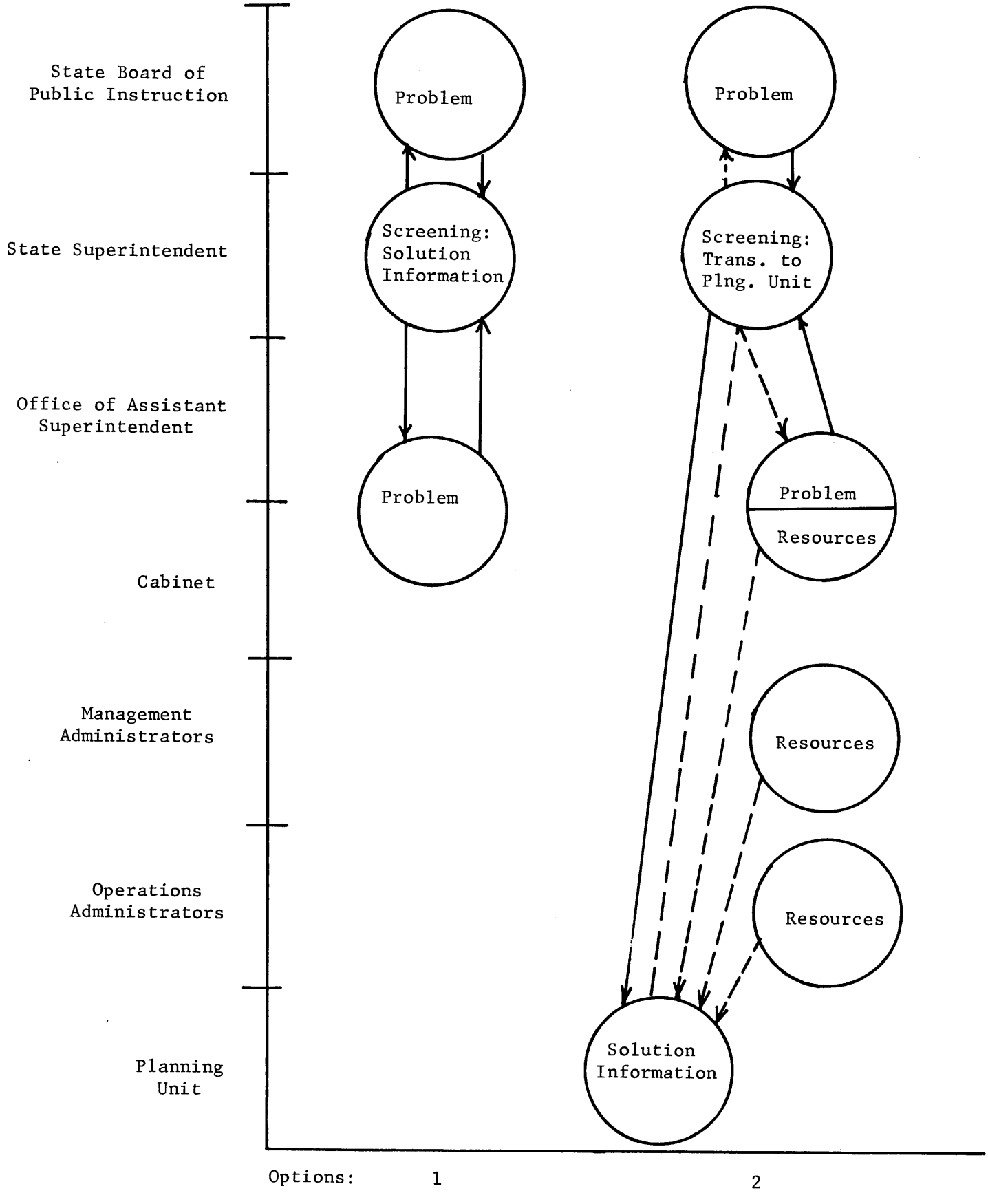


Fig. 9 Channeling Problem Inputs Originating at the Strategic Planning Problem Level.

ment, and Evaluation unit and its line of authority in the SEA Central Administrative structure. This position of the unit is ideal for maintaining a staff function in the provision of solution oriented information through the channels described earlier. However, as noted in the introductory section, the personnel of this unit presently operate within the scope of specific problems assigned to each by the superintendent. The present unit structure and manner in which problems are assigned makes coordination of unit personnel an informal activity, often absent. As a result, the efficient utilization of planning personnel resources with regard to the total number and range of problems which can be processed, the depth and detail of information which can be provided, and planning directed to the overall goals of the SEA, suffers.

To implement the concepts formulated in the course of this study, we believe minor modifications in the organizational structure of the present planning unit are necessary.

Suggested Modifications

1) The present Planning, Development, and Evaluation unit should be renamed to make it clear in the semantics of the unit name that the services to be provided by the unit are informational in nature and not the operation of educational programs as may be now assumed from the term Development in the present title. Also the name given to the unit should indicate: the major types of informational services it can provide for any problem input directed to it, and its special staff status in the SEA organization. A suggested name for the unit is Research, Planning, and Evaluation Information Bureau.

State of Iowa
DEPARTMENT OF PUBLIC INSTRUCTION

ORGANIZATIONAL CHART FOR CENTRAL ADMINISTRATION
and
PLANNING, DEVELOPMENT AND EVALUATION

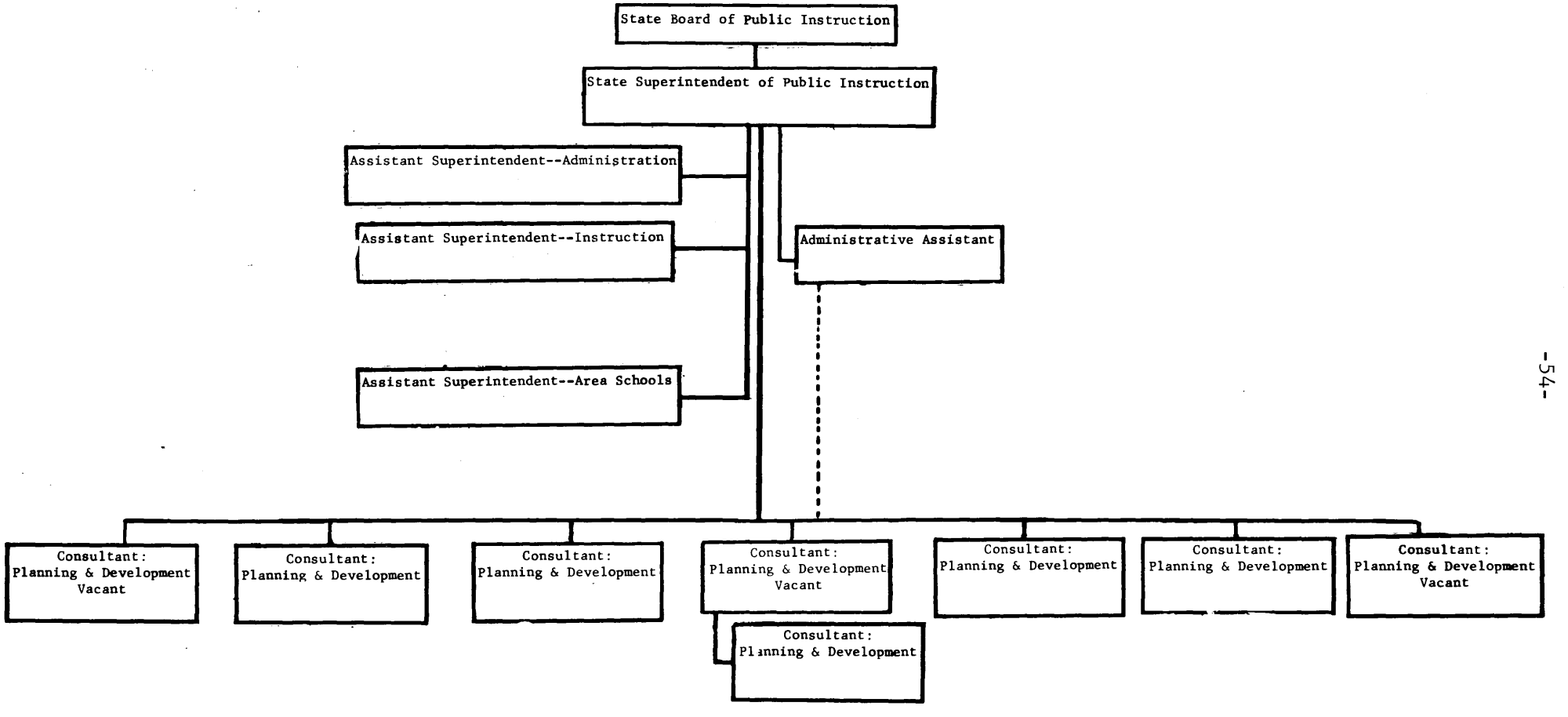


Fig. 10 Organizational Structure: SEA Planning, Development, and Evaluation Unit.

2) The individual professional staff positions of the unit should be renamed from the present Consultant, which does not connote staff function, to Planning Associate, which will.

3) The present line of authority between each of the professional members in the planning unit and the state superintendent should be maintained to insure open and accessible channels of communication, however, one member of the planning unit or the Administrative Assistant should be given the responsibility and attendant authority to coordinate the overall operation of the unit. (See Fig. 10a and 10b). It is suggested that the title Planning Head be given to this individual which will designate this responsibility but will not detract from equal staff status of the other members of the unit, since Planning Associate implies equal general general status within the unit structure. Both titles, Planning Head, and Planning Associate, are sufficiently distinct from the existing titles of personnel within the SEA to insure that no confusion is created which may indicate that the nature of these positions are related to program operations.

4) Each professional staff member of the unit should receive an intensive training program in systems approaches to planning. In addition, each member should have competence in a specialized professional discipline which is basic to the overall function of the unit. "The orientation of the planning staff, however, should not primarily be towards their respective professions, but focused upon the actual problems to be faced by educational administration. Staff members should be taught to regard themselves as educational planners with a certain professional bias, rather than professionals who happen to be concerned with educational planning.[1]"

[1] Op. Cit., p 15.

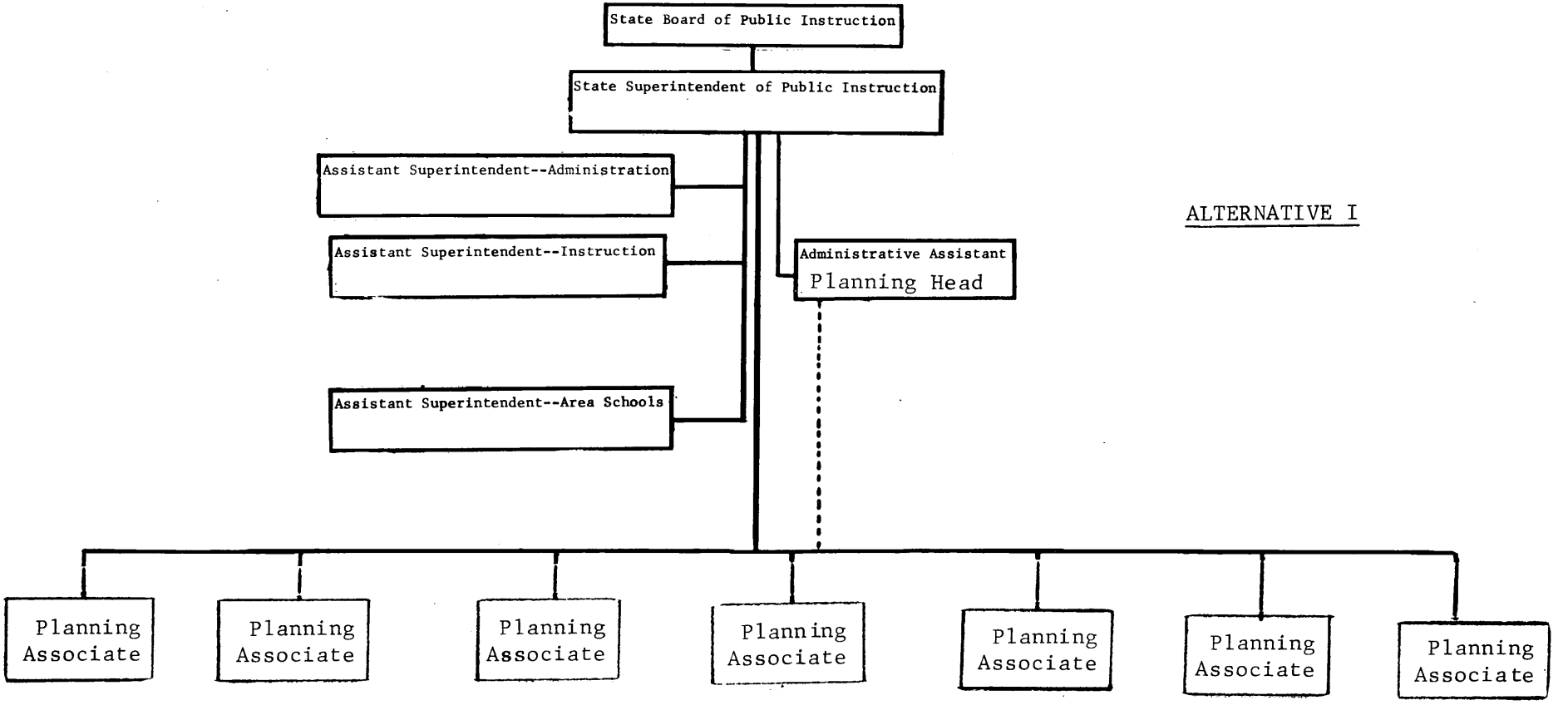


Fig. 10 A. Proposed Organizational Structure: Research, Planning, and Evaluation Information Bureau

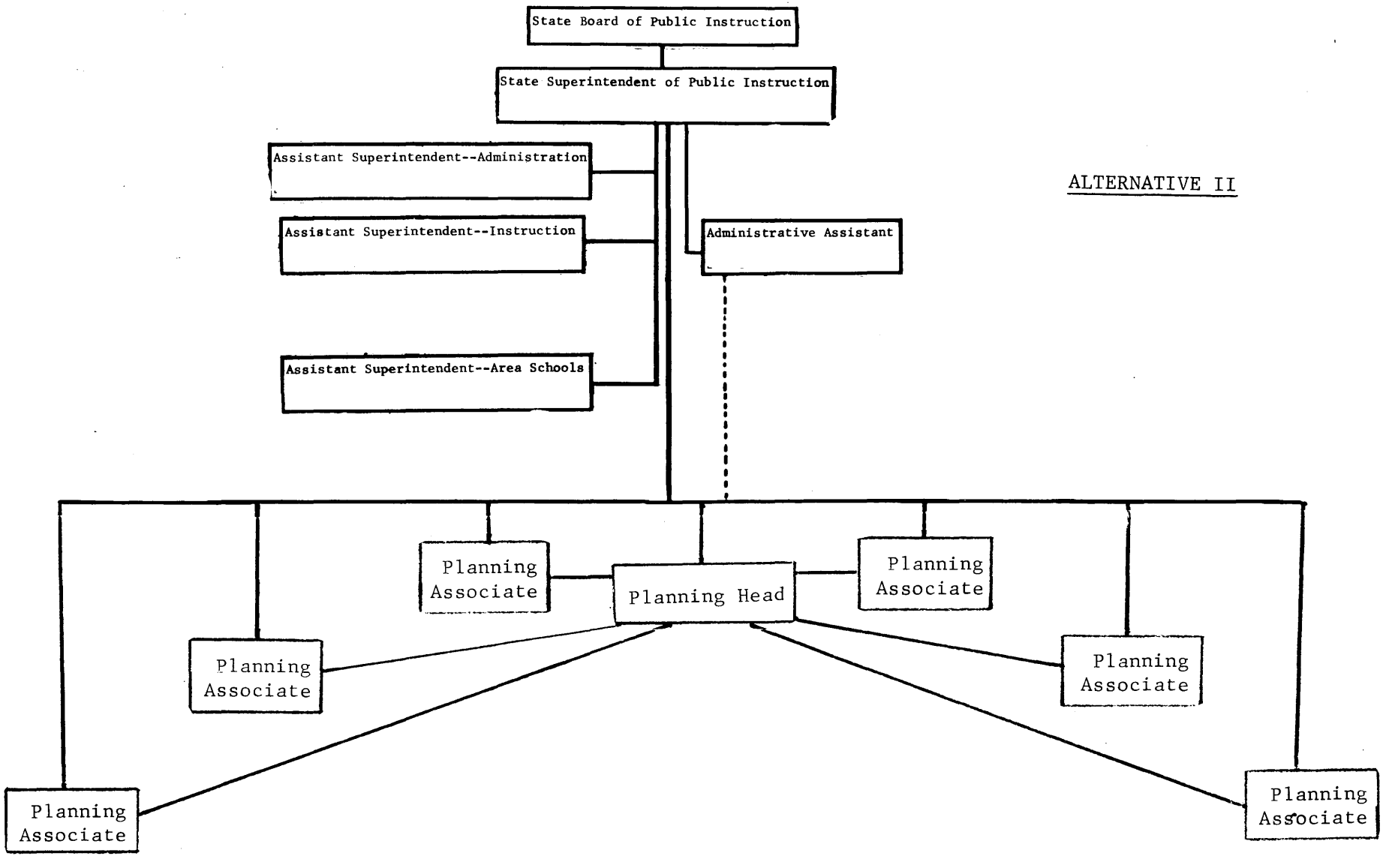


Fig. 10 B. Proposed Organizational Structure: Research, Planning, and Evaluation Information Bureau

CHAPTER IV
STAFF DEVELOPMENT

Description of Planning Unit Staff Competencies

To specify the staff competencies for comprehensive planning which may focus upon any problem input would require the description of professional training and skills of the entire SEA professional staff and a wide range of research agencies whose services at times might have to be contracted. The preceding section dealing with SEA organization for planning indicates how the resources of SEA personnel may be allocated for a given problem input. The staff competencies of the planning unit personnel should be such as to best make use of SEA resources in the provision of problem solutions for SEA decision makers. We believe the competencies required to support the overall planning effort in a planning unit with eight professional positions (reference: Fig. 10a or 10b) to be as follows:

1) one member to be expert in educational administration, supervision, and coordination skills with ability to:

a) provide liaison for the planning unit with state planning and other agencies that may be involved in unit activities related to a given problem

b) coordinate the effort of all planning staff members working on specific problem inputs

c) maintain an ongoing record of the problem inputs and planning unit resources committed to each, so that up-to-date information may be available for the reassignment of priority for problem inputs should the resources of the planning unit become critical

2) one member to be expert in educational research design and systems engineering who will provide direction for the unit's activi-

ties in systems analysis, systems synthesis, and preparation of management tools such as PERT and CPM networks

3) one member to be expert in communications techniques such as:

a) developing communication networks with elements of the RWE and SEA

b) perceiving and analyzing the significance of information received from environmental elements for the purpose of validating problem input data (See Appendix II).

c) developing effective public information materials

d) conducting in-service training programs

4) one member to be expert in the knowledge of and interpretation of laws which focus upon educational parameters

5) one member to be expert in the philosophy of education as relates to social, political, and economic needs of society and who is expert in techniques for researching and retrieving a wide variety of required educational data and information from sources within and outside of the SEA

6) one member to be expert in the knowledge of elementary, secondary, and post secondary curriculum including how to effect curriculum change at the institutional as well as the contact level of teaching--learning

7) one member to be expert in descriptive and inferential statistical techniques, procedures, and data handling, including electronic data processing techniques

8) one member to be expert in the preparation of applications for the full range of federal and private sources of funds for the development of educational programs and projects at both the SEA and local educational agencies level of application.

In-service Training in Planning

As stated earlier in this report, "in-service training in planning within the SEA is in itself a planning technique utilized by a planning unit and oriented to: efficiency of agency operations, establishing SEA in-house communications networks based upon similar technical language and concepts, and reducing the overall number of problems directed to the planning unit, allowing it to concentrate upon complex priority problems..." The need for in-service training in planning within the SEA should be considered as an ongoing activity and should be a major segment of the SEA orientation program for new professional staff members.

Providing educational leadership to schools is the most recurring function identified by each of the operating divisions of the SEA as ascertained from an inspection of Proposed Departmental Activities and Goals. Leadership function statements have been found to be prominent in SEA publications in our review of materials dating back to the 1963-64 school year. Developing leadership can be, therefore, legitimately added to the list of reasons for providing in-service training in the planning process to professional staff members of the SEA. Ways in which the planning process support the leadership role are identified in detail by Sheriff and West.

The general characteristics of effective leadership, as reported by Sheriff[1] operate on three levels, technical skills (operational control problems), human skills (management control problems), and conceptual

[1]Sheriff, Don R., Associate Professor and Director, Center for Labor and Management, College of Business Administration, University of Iowa, Leadership and Human Behavior in the World of Work, an address to the personnel of the Department of Public Instruction, Des Moines, Iowa, January 8, 1968.

skills (strategic planning problems). When professional staff members are recruited from the field, or promoted from within the ranks of the SEA to a more complex leadership role, one of the personal difficulties they encounter is to give up some of the skills they had been using and to which they are accustomed and develop those skills incumbent in their new leadership positions. Sheriff[1] identifies six general charachteristics of effective leadership: intelligence, communication ability, broad and well rounded interests, problem solving and decision making, mental and emotional maturity, and a healthy human relations attitude. If intelligence is defined as a parameter of quality concerning behavior in specific instances, and if mental and emotional maturity can be measured by the degree to which an individual understands himself and is able to delegate responsibility to others, and if a healthy human relations attitude is governed by an individual's ability to understand others, then in-service training in planning as a process will enhance all six of the leadership characteristics identified by Sheriff.

West[2], in describing approaches to leadership indicates that the five functions in which management should engage are: planning, organizing, motivating, controlling, and developing management abilities of subordinates. He goes on to specify that the essential characteristics of leadership necessary to carry out these functions are:

[1] Op. Cit.

[2] West, Jude T., Associate Director, Center for Labor and Management, College of Business Administration, University of Iowa, Approaches to Leadership, an address to the personnel of the Department of Public Instruction, Des Moines, Iowa, January 8, 1968.

1) Leader must make good decisions
   a) he thinks through the problem
   b) he foresees possible obstacles and ways of overcoming them
   c) he gets the facts
2) Leader must motivate
   a) he must realize the needs of his people
3) Leader always has the situation under control
   a) planning in advance
   b) checks work against standard
   c) asks for reports on certain milestones of the program
      i) what is most serious
      ii) what is most probable
      iii) what is invisible
4) Leader assumes responsibility
   a) more than not passing the buck
   b) acceptance of additional responsibility
   c) leader who is not respected is not a leader
5) Leader gives everyone a square deal
   a) he doesn't make promises he cannot keep
   b) he does not exploit the willing worker
   c) he does not let others lie down on the job
   d) he does not put his colleagues on the spot
6) Leader inspires confidence. How earned?
   a) by managing his job
   b) showing concerns for the needs of his people
   c) helping them when difficulties arise
   d) by defending them

There are a number of ways in which in-service training may take place. Two possibilities occur to us at the present time.

Specialized In-service Training Program

First, a specialized training program focusing on the planning process may be undertaken as an in-house SEA activity or as an out-of-house activity to provide training to personnel employed in other levels of school organization within the state. Such a specialized training program could include the following areas:

A) Introduction to Network Based Management Systems
    1) Nature and Functions of Management
    2) Management Process
    3) Program/Project Management

B) Nature of Management Systems
    1) Project Planning and Control Steps
    2) Project Definition Phase

C) Network Construction
    1) Time Estimation
    2) Scheduling/Resource Allocation

D) Organization and Implementation

Orientation In-service Training Program

Second, an orientation type of program, which would be broader in scope, containing elements of the planning process as integral portions of program topics, could be conducted periodically for new SEA professional personnel and for invited personnel from other levels of school organization within the state. The outline for this type of program might vary

from time to time, however, in general would include the following areas:[1]

A) The challenge of public service

1) public's image of state employees

2) state employees image of self

3) challenge of change

B) Management and organization

1) organization and objectives of the SEA

2) the professional employee's part in achieving organizational objectives

3) functional organization of the state

4) line and staff organization of the SEA

5) changing concepts of management, operation and organization systems

C) Communications

1) characteristics of effective communications

2) barriers to communications

3) the work climate and communications

4) giving assignments for action

5) communication channels and coordination

D) Leadership skills

1) motivation and leadership

2) methods of providing effective managerial leadership

a) management skills

i) planning process

[1]Adapted from Management Development Program, as received from Dr. Sydney M. Grobman, Director, Office of Career Development, Commonwealth of Pennsylvania, Department of Public Instruction, Harrisburg, June, 1968.

ii) organizing: structure, procedure, resources and fundamentals of organization

iii) coordination: purpose, techniques, operations, and information

iv) directing: changing procedures as needed

v) controlling: management by objectives, use of tools such as PERT, CPM, and other networks.

3) management systems

a) application of electronic data equipment to SEA operations

b) current budgeting system: impact of federal government on objectives

c) Planning, Programming, Budgeting, Systems (PPBS)

E) Performance standards and evaluation

1) purpose of performance standards and evaluation

a) motivation through performance evaluation

2) preparation and use of written performance standards

3) making the performance evaluation

These and other recommendations for implementing planning as heretofore described in this study will be considered in the following section.

CHAPTER V
RECOMMENDATIONS

The special project staff during the past year has been engaged in a study directed to drafting and testing the ideas reported here for implementing a research, planning, and evaluation information unit for the SEA. This report of study findings marks the close of Phase I of this endeavor. Phase II will be concerned with making the research, planning, and evaluation information unit an operational reality.

The need for initiating Phase II without delay stems directly from the simple fact that the world is changing--rapidly. "The nation's human, financial, and technological resources indicate that the economy has enormous promise for growth in the future. The United States, which is now producing goods and services at a rate of $750 billion a year, should be producing at a rate of at least $1 trillion a year in 1975. By that time the labor force is expected to be some 20% greater than it was in 1965, and its quality is expected to improve from year to year. Capital spending, now at a rate of $62 billion a year, is forecast at about $90 billion by the mid-1970's."[1]

Today we are trying to solve problems infinitely more complex than ever before. We are trying to understand the difficulties faced by emerging countries of which thirty years ago we had never even heard. We are struggling to deal with a deluge of facts, opinions, and other information from everywhere brought to us with a speed and in a volume that threatens to drown us all in words. We are trying to cope with a value system based on plenty rather than poverty, and an ethic increasingly oriented to leisure rather than work. And the change comes faster each year. It doesn't take an intensive amount of thought to realize

[1] Growth Stocks, a report published by the Securities Research Division, Merrill, Lynch, Pierce, Fenner, and Smith, Inc., New York, May, 1966, p. 1.

that the demands we are making on our educational system are different than they were a few years ago; they are much greater than they were a few years ago. Our choices are painfully obvious. We can let our educational system flounder trying to adjust to the changing and increasing demands made upon it, or we can try to look ahead a bit, figure out where we want to go and some of what is needed to get there, and set about getting it done.[1] In a sense the entire contents of this report recommends a process for implementing comprehensive planning in the SEA. Implementing these recommendations by logically sequential steps that are consistent with the principals of change requires: the perception of the obvious need to do so; a commitment to getting the job done which operates deeper than the oral level of agreement; and involvement on the part of all concerned which goes beyond conceptual activity, and results in direct and meaningful action.

The following recommendations indicate what we believe to be the steps necessary for implementing the increased efficiency and capacity for planning in the SEA. (These recommendations are number-keyed to network events depicted in Fig. 11):

1) Start to acquire resources for implementing activities leading to achievement of events in this network.

2) Start to conduct in-service training in planning process techniques for SEA administrative and professional staff.

3) Start to employ Planning Associates to fill present vacancies in the planning unit (priority for positions 2, 3, and 5; reference: pp 58-9 of this report)

[1]Taken from an Address presented by Professor Don Wells, at the Educational Planning Conference, Iowa State University, Ames, Iowa, October 17, 1967.

Major Milestone Network of Events: IMPLEMENTING COMPREHENSIVE PLANNING IN THE IOWA STATE DEPARTMENT OF PUBLIC INSTRUCTION

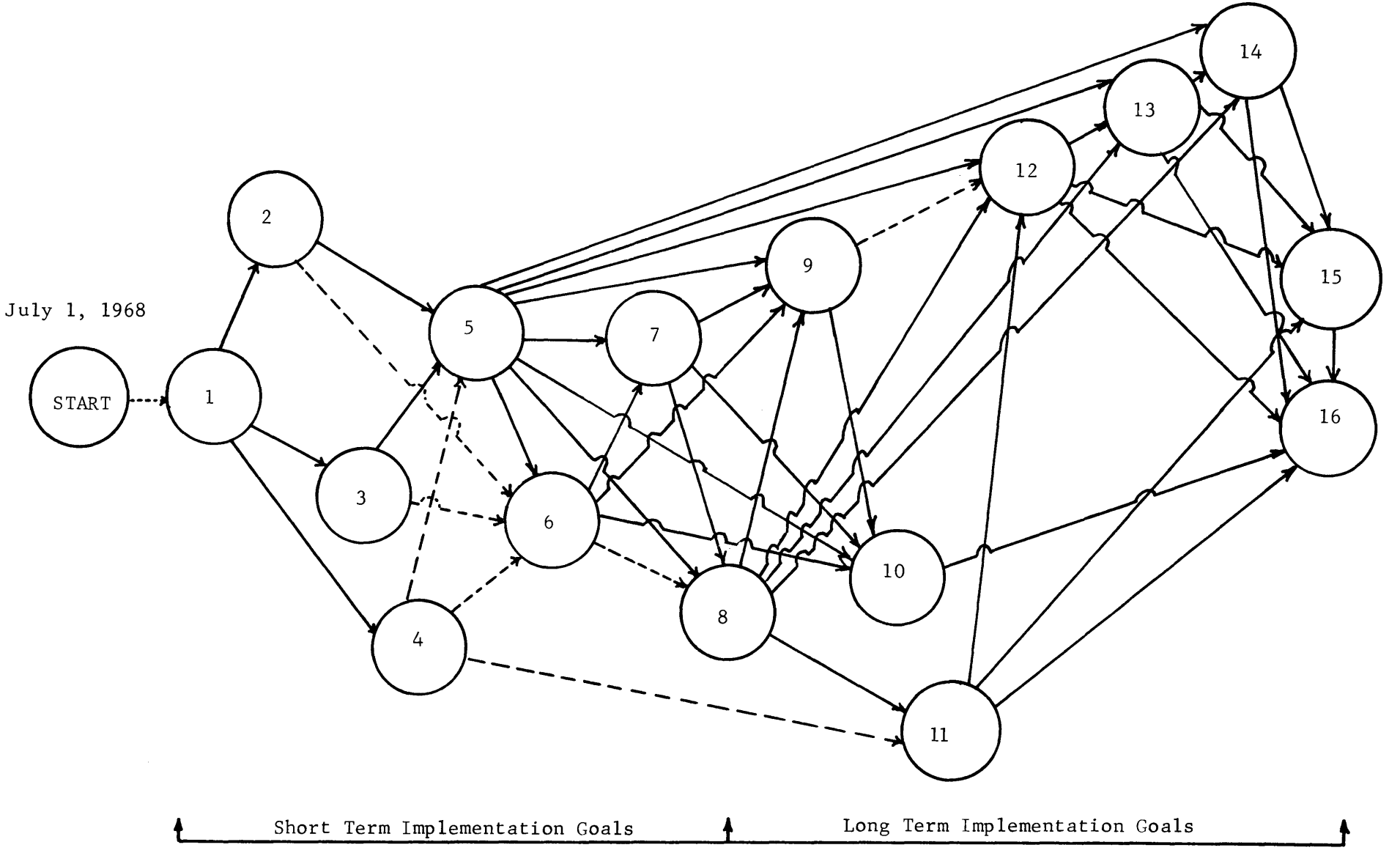


Fig. 11 Planning Implementation Network

4) Start to disseminate Comprehensive Planning Process Report to elements in the Iowa RWE (including SEA).

5) Start to establish in-house planning communications network.

6) Start to reorient and make available additional equipment to Data Systems Division to meet the needed increase for information handling and retrieval capacity and capability.

7) Start to provide data banks of information concerning time, performance, and cost of basic activities in which the SEA now engages.

8) Start to initiate referral system of problem inputs to Research, Planning, and Evaluation Information Bureau.

9) Start to provide electronic computer simulation programs for strategic planning purposes.

10) Start to establish comprehensive Planning, Programming, Budgeting, Systems (PPBS) for SEA.

11) Start to establish efficient planning communication networks with elements in the RWE.

12) Start to reidentify and project-in-time- Iowa educational goals.

13) Start to identify comprehensive SEA management strategies for achieving educational goals.

14) Start to initiate comprehensive SEA operations for attaining Iowa educational goals.

15) Start to provide optimum SEA services and leadership to Iowa school systems.

16) Start to achieve the maximum utilization possible of resources in the development of state educational programs.

APPENDIXES

APPENDIX I
EXAMPLE OF VALIDATION TECHNIQUE (VALIDITY FEEDBACK LOOPING)

PROBLEM

The Iowa Project Staff of CPSEA is engaged in developing plans which will lead to the identification of a model relative to designing and implementing a state unit for Comprehensive Educational Planning.

The project staff is following a systems analysis approach in an effort to identify a model which the State Education Agency will be able to make operational in a state unit for comprehensive planning and which will provide this unit with information which will allow it to function in as comprehensive a manner as possible.

We are at a point in our systems analysis where it is necessary to identify the political, social, and economic environmental elements which affect educational planning. This is necessary so that we may assess what expected goals such elements may have with regard to comprehensive planning for the state education program. Also it will be necessary for the planning project to determine strategic variables and anticipate probable influences of such elements in order to design a model which is sensitive to the environment.

SOLUTION

We hope to engage a staff of experts to help in

1) identifying these environmental elements
2) analyzing possible strategic variables which these elements present individually and in combination in a system
3) identifying probably influences such elements may have on future comprehensive education planning activities in which the state education agency may engage.

We hope to identify the above information by means of a number of activities which are oriented to involving legitimate representatives of the environmental elements. Involvement activities will center upon reacting to questions developed by a staff of experts which are designed to secure data which these experts may then analyze for the purpose of providing the desired information.

The following is a description of functions to be carried out by experts and representatives of environmental elements.

(Operational definition of expert: one who is cognizant of the elements and organizational structures representing such elements in one or more of the following environmental spheres operating in the state of Iowa: political, social, economic.)

The experts will be engaged to develop a list of elements and organizational structures representing such elements for use by the project unit in inviting representatives of the structures to participate in a conference activity.

The experts will then meet for a pre-conference planning meeting. This will be a one-day meeting. The first portion will be to clarify expected roles and functions of the staff of experts. The remainder and major portion of the day will be divided into two parts. During the first, the experts will team up by specific environmental sphere for the purpose of developing materials to solicit reactions from representatives of environmental elements in the form of data which the experts may then utilize in an analysis of possible strategic variables and in identifying probable influences such elements may have on comprehensive planning activities in which the state education agency may engage. During the second portion of the day's activities, all the experts will meet to develop material for the same purposes but oriented to the effect which may be anticipated when elements from all three spheres of the environment operate in an interrelated system.

The materials developed by the experts will be left with the project staff at the end of the day and will be duplicated and transmitted to representatives of organizational structures who accept the invitation to attend the conference.

The concluding activity of the day will be the defining of the interaction to take place during the conference between the experts and representatives for purposes of helping the experts to validate the materials they have developed. This conference design activity will be conducted by a communications expert contracted for that purpose.

The conference for the representatives will take place according to the format developed by the communications expert. This will be designed to afford the experts the best possible means of deriving the information they need to provide for the project staff. Toward the end of the conference day the communications expert will meet with the other experts to discuss assignment of responsibilities for drafting the final document of information to be transmitted to the planning unit. The communications expert will assume overall responsibility for transmitting the final document on deadline.

Individual Roles and Responsibilities to be Assigned to Conference Staff Members:

Communications Expert:

I. Assess conference planning strategy.
II. Assess pre-conference transmittal of information tactics to participant representatives.
III. Assess pre-conference meeting in terms of experts' objectives. Prescribe conference didactics and interactions to produce information needed by experts to complete their assignments.
IV. Be responsible for conducting the conference.

V. Be responsible for compiling information provided by experts into final report for transmittal to planning project staff.

Experts:

I. Identify environmental elements affecting educational planning in Iowa from the following spheres: social, political, economic.
II. Identify organizational structures which represent these elements.
III. Transmit information in I and II above to the project staff.
IV. Attend pre-conference one-day meeting for following purposes:

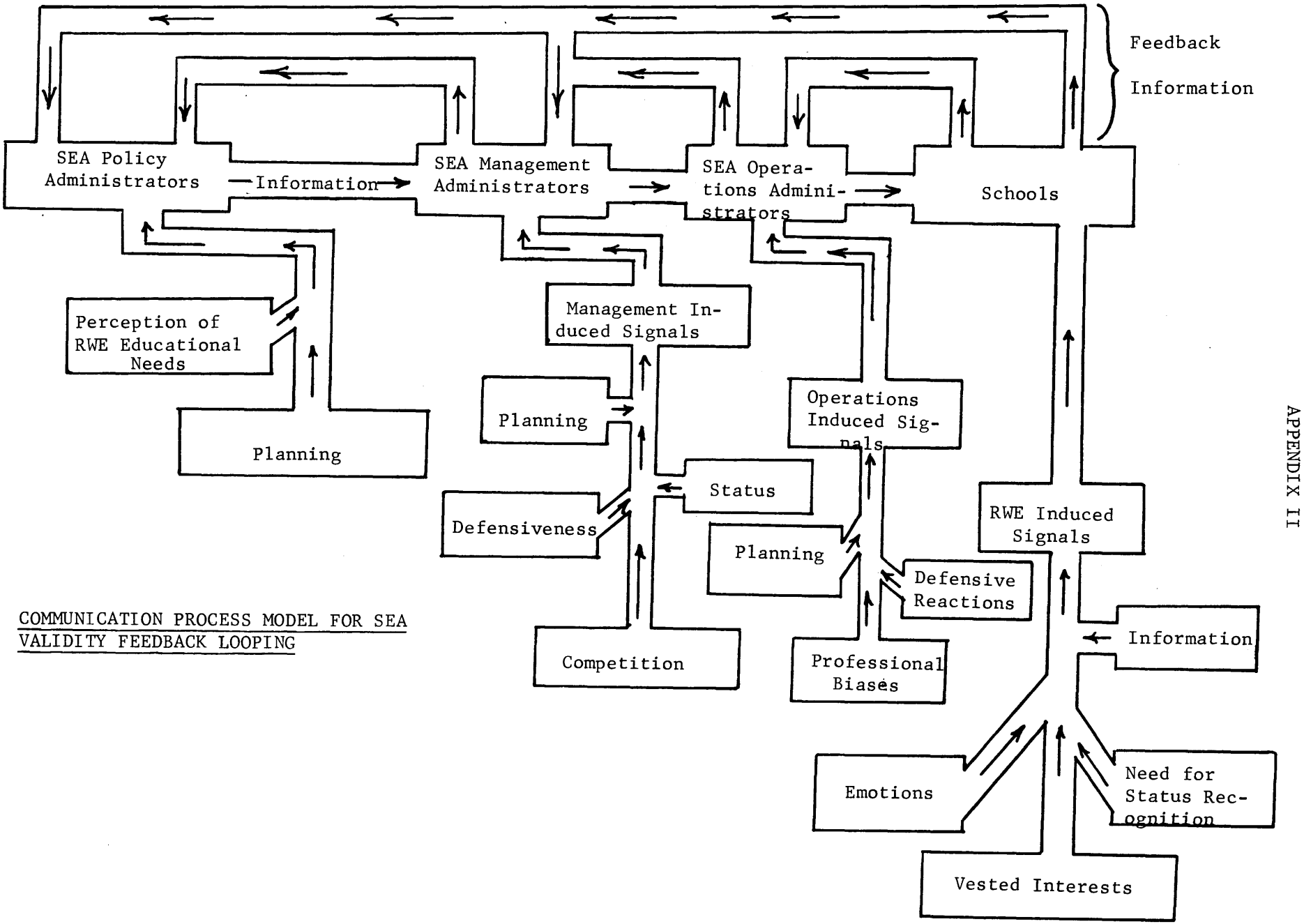
A. Orientation to desired information required by project staff.
B. Develop materials to:
1. Assess what the representatives of the various elements regard as desirable goals for comprehensive educational planning. (Operational definition of comprehensive educational planning developed by project staff.)
2. Assess which elements in the environment are relevant and the extent to which they determine strategic variables.
3. Anticipate probable influences of such elements upon comprehensive educational planning.
4. Assess how these three environmental spheres operate in an interrelated system affecting comprehensive educational planning.
C. Develop and leave these materials with the project staff for pre-conference dissemination.
D. Work with communications specialist to structure conference didactics and interrelationships which will lead to an opportunity for the experts to utilize their materials in the identification of the desired information.

V. Participate in the conference in keeping with the conference design developed by the communications expert.
VI. Report requested information (IV, B, 1, 2, 3, 4) to communications expert in a form amenable to compiling for final report.

Validators:

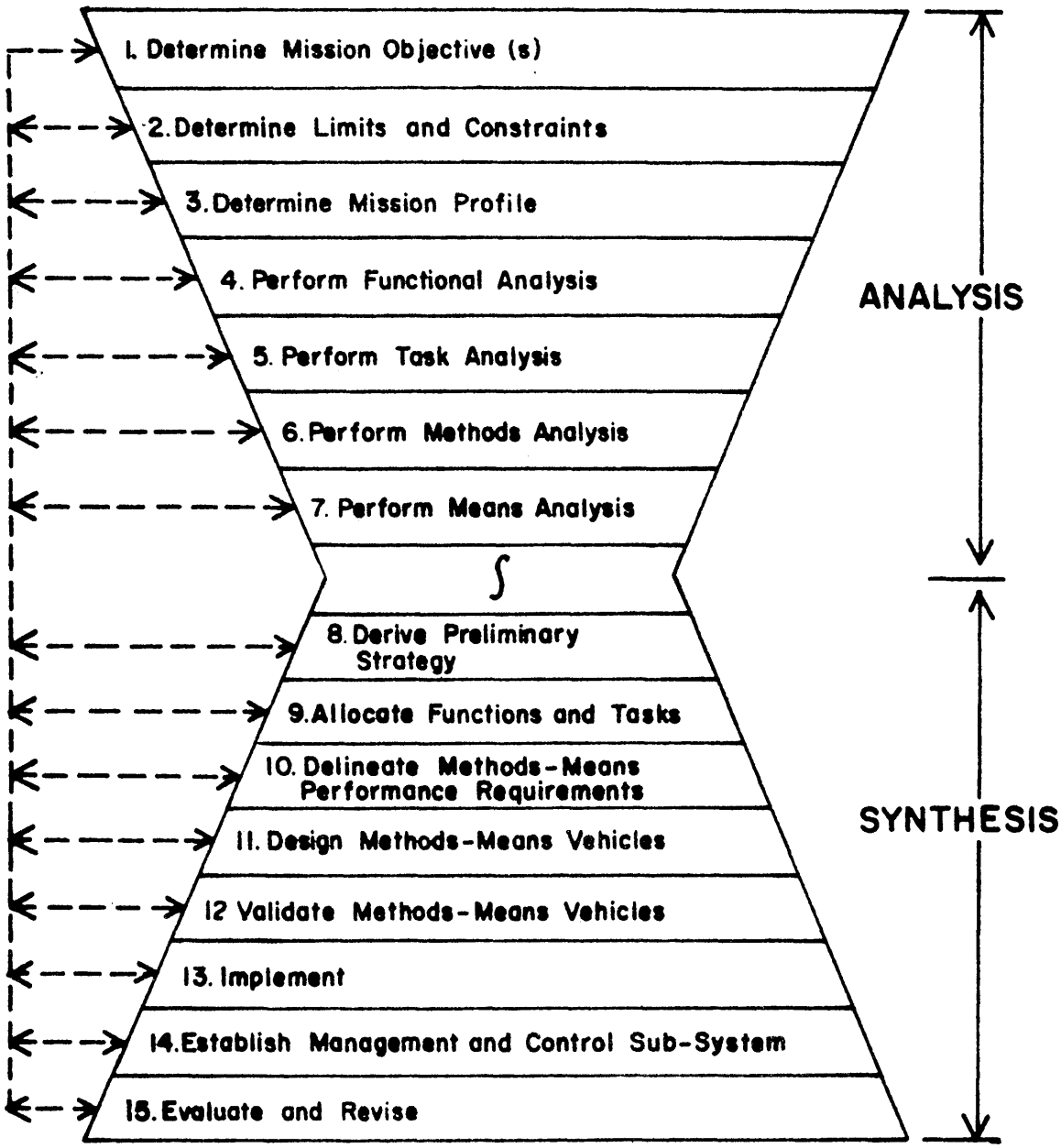
The project staff believes it would be of value to have an independent evaluation of the information reported to the project staff as a result of the aforementioned activities. Three professional educators will be contracted to assess the activities and information generated thereby for the purpose of:

1) providing the project staff with an assessment of the validity and 'level of significance' of the information generated.
2) indicating the possible existence of any gaps in the information reported.



COMMUNICATION PROCESS MODEL FOR SEA VALIDITY FEEDBACK LOOPING

A Model of The System Approach to Educational Planning and Development[1]



[1] Corrigen, Robert E., Kaufman, Roger A., et. al., The Tools and Steps of the System Approach to Education, prepared for Operation PEP, January, 1967.

APPENDIX IV
ENVIRONMENTAL INPUT--OUTPUT MODEL

This model can help to explain how the general environment is reacting to a given problem in terms of energy, resources and information, and what activities in seeking the attainment of its goals the SEA may undertake in system (SEA)--environment (RWE) interrelationships.

The model makes use of electronic analogies because as with electricity, we don't understand the exact makeup of some of the environmental inputs, such as the input referred to as energy. However, as in electronics, we believe it is not entirely necessary to understand the exact makeup of a phenomenon in order to measure it or harness it for desirable outcomes.

Because we use electronic terminology to describe by analogy the functions of some of the elements presented within this model, it is necessary to provide the reader with the definition of terms used.

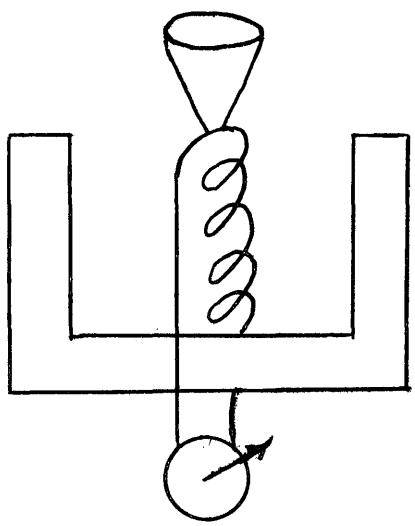


Fig. 12 Dynamic Transducer

Dynamic Transducer:

This is a device which transmits energy from one form to another. An example of such a device taken from the field of electronics would be a microphone (See Fig. 12). Simply stated, this consists of a cone attached to a coil of wire which is positioned within a magnetic force field. Sound waves impinging on the cone move the coil of wire within the magnetic field, generating a measurable current within the coil of wire. This process may be reversed. By generating a current through the coil of wire, the cone may be set in motion, producing sound waves. This is the principle by which most high-gain loudspeakers operate.

The value of utilizing the transducer concept as a model element lies in the opportunity it affords planners in 1) hypothesizing cause and effect relationships, 2) suggesting functional activities for the SEA which lend themselves well to strategic planning processes which, at times, may include attempts to modify environmental pressures, and 3) points within the model at which measurement may be attempted for the purpose of analysis (testing hypotheses).

Encoder:

This is a device which is capable of separating a signal emanating from a complex source of energy into discrete portions and transmitting each portion as a separate entity, either in the original energy mode or transduced from one mode to another.

An example of such a device taken from the field of electronics is the first stage of the vocoder (See Fig. 13). This is a device which utilizes a series of narrow band filters which transduce only those

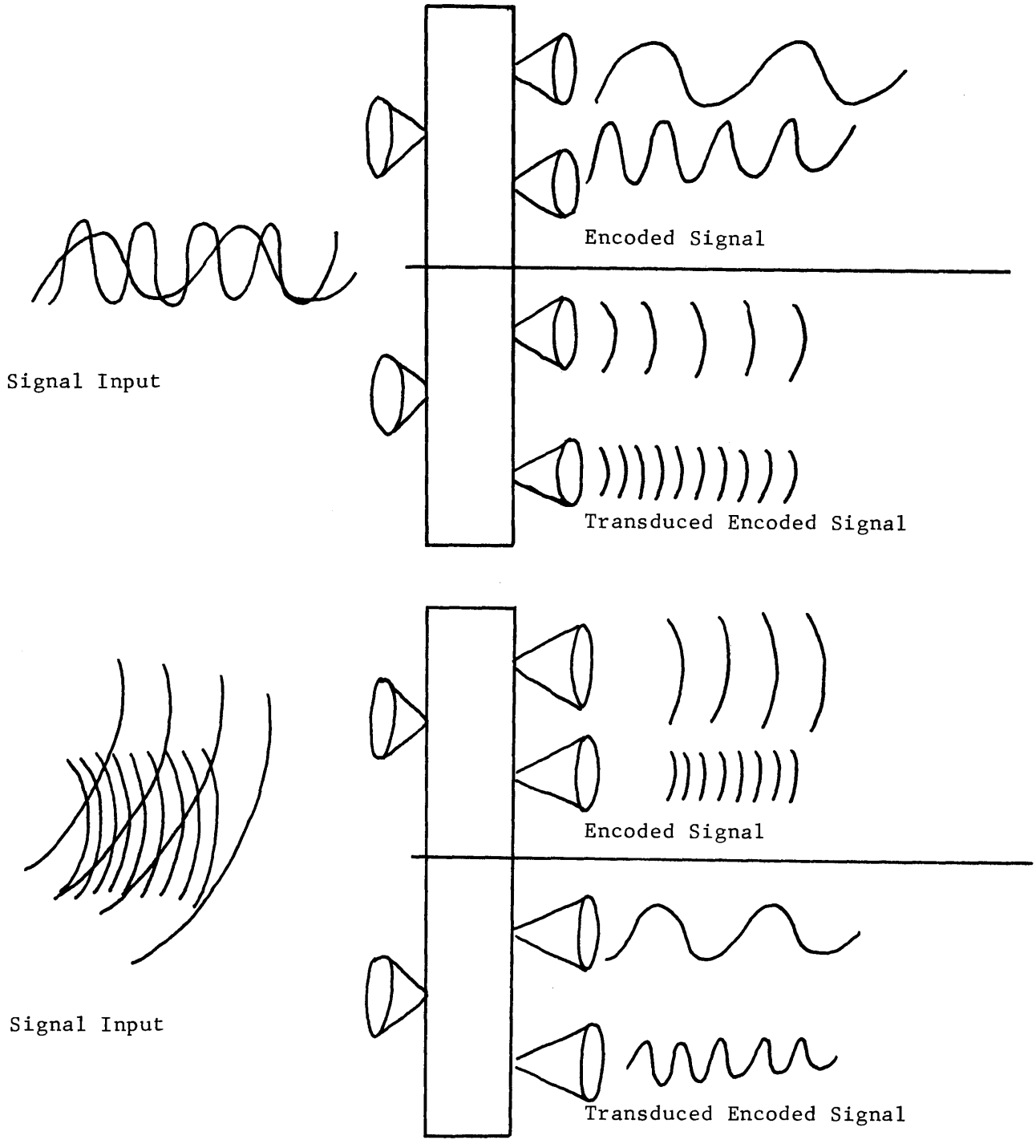


Fig.13. Examples of Encoder Function

portions of the audible speech range which are essential to intelligibility into electronic impulses for line transmission. The practical purpose which this device serves is to reduce the degree of energy which a line must carry at any given point in time, thus increasing that line's potential to carry a greater number of messages simultaneously.

The value of utilizing the encoder concept as a model element lies in its potential for: 1) describing, for purposes of analysis, the covert energy in the form of educational expectations which the RWE transmits overtly via a complex variety of substratified agencies and social institutions. These are usually observed as a variety of vested interest groups, lobbyists, news media, editorialists (and other public opinion formers), etc., and as activities which may be noted from voting practices, 2) the ability to identify cause-effect-cause cyclical relationships which may be noted from feedback phenomena that occur when given vested interest groups are able to modify the pressure for educational expectations of the RWE, and 3) providing strategic information to educational decision makers pertinent to the variety of alternatives available to them in which the SEA may engage to best: boost, or reinforce; counter, or negate; or redirect the pressure formulated at the usually invisible operational level of the RWE.

Decoder:

This is a device which is capable of combining energy impulses from an encoded mode of transmission and assembling them as an accurate representation of the pre-encoded signal, or assembling and transducing them as a representation of the pre-encoded signal in a different energy mode. (See Fig. 14)

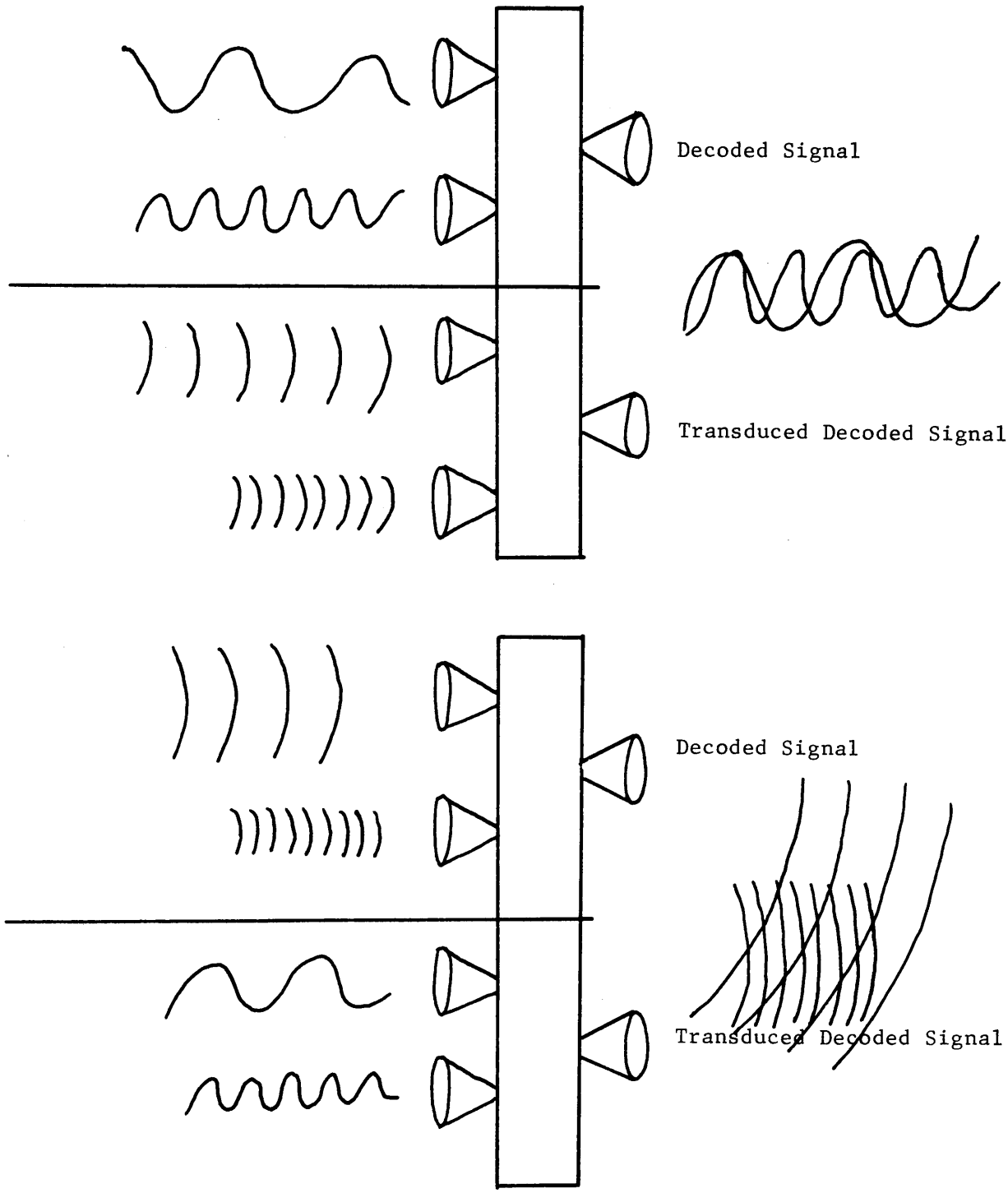


Fig.14. Examples of Decoder Function

An example of such a device taken from the field of electronics is the second stage of the vocoder. This stage reassembles the discrete electronic energy transduced by the narrow band filters of the encoder into complex electronic energy which is then transduced by a speaker unit capable of producing sound waves over the audible range of hearing permitting the acquisition of an intelligible signal.

The value of utilizing the decoder concept as a model element lies in its potential for analyzing the activities of elements in the RWE, i.e., the Legislative Branch or Executive Branch of Government in their roles of representing the general environment and in their transduced activities of providing the financial resources, legislation, and policies directly affecting the SEA.

The environmental input-output model treats inputs of energy, resources, and information as highly interrelated factors, with the results of their interactions usually operating at three levels of visibility (See Fig. 15).

Levels of Visibility

The model refers to the first such level as covert, in that the interrelationships operating at that level are not easily seen or identifiable; and any information concerning such interrelationships usually remain at the speculative stage.

The second level of visibility is that which can be seen or identified as a result of analysis, which in this model, is defined as the testing of hypotheses which refer to covert level interrelationships by testing data which is available from a variety of sources that operate on the overt level.

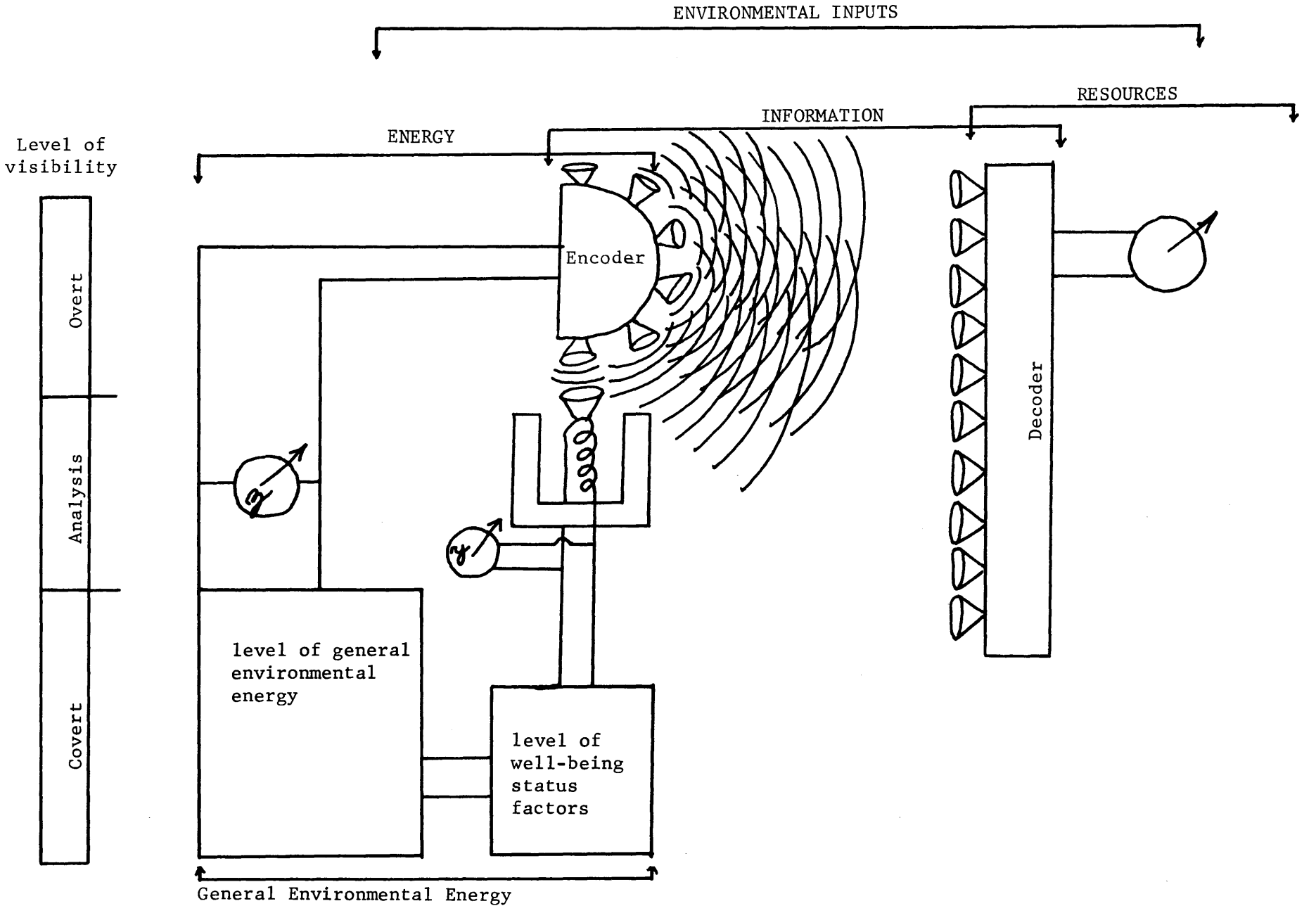


Fig. 15 Environmental Input--Output Model

The third level is referred to as the overt level. At this level the interrelationships take on visibility in the form of information, demands, objections, and other quantifiable descriptive data from a large number of sub-stratifications of the general environment. However, such information is not easily acted upon because of the complex, voluminous, and often scrambled signal which emanates.

Environmental Inputs

Energy:

This model is based on the assumption that the energy emanating from the general environment, which we have labeled the z factor, is an ever-changing product which results from: 1) the socio-psychologic needs of individuals, and the ethnic, social, economic, and political groupings with which individuals identify, as modified by 2) the status of what individuals in the general environment believe to be their level of well-being at any given time, which we have labeled the y factor.

Information:

The level of general environmental energy (z factor) is subject to modification by information which is generated by sub-stratifications of the environment and transmitted (fed-back) back to the environment in general. The degree of effectiveness such information has upon modifying the total energy output of the general environment is governed by those y factors which the consensus of individuals that compose the general environment believe to be responsible for determining their level of well-being status. These y factors are represented in the model as transducer force fields operating within an energy-information closed-loop feedback cycle.

y factors which can operate as force fields for the general environment feedback transducers must be capable of modifying energy at the

covert level. Therefore, they must be capable of stimulating the environment as a whole instead of fractionalized sub-stratifications of the environment. For that reason, force field factors will be represented in the model in terms which are generalizable to individuals in the environment, rather than to the variety of constellations in which individuals may, at times, be found to be grouped at the overt level. Once these factors are identified through analytical activity, they may be utilized in the model for: 1) formulation of strategic planning hypotheses based upon SEA-environment interrelationships, and 2) subjecting such hypotheses to inferential statistical analyses in order to provide planning information relevant to the consequences of a variety of alternative solution strategies.

Resources:

The total modified environmental energy (z factor) produced in the environmental energy-information loop is transmitted to the legislature and executive branches of government which, in addition to being elements in the general environment, act as decoders in that they purport to be sensitive to the general environmental energy for purposes of transducing it into resource appropriations, as well as statute constraints and policies within which the SEA must operate. The model provides a basis for analyzing z factors with an end to finding critical levels of z which are necessary to effect those strategic planning activities of the SEA which are related to resources.

Let us examine how the Environmental Input-Output Model might be utilized by the SEA planners in providing information for a strategic planning problem.

The SEA decision makers want information about the feasibility of increasing SEA leadership capacity to local educational agencies within the state. The increase of such services is dependent upon an increased appropriation for the SEA's operating budget. The problem input is stated as: Can the SEA anticipate an increase of "x" dollars in its next operating appropriations?

The model allows the planning unit to make a number of hypotheses, to help decision makers to determine the nature of activities that are required for goal attainment. For example:

1) goal attainment is chiefly dependent upon the nature and level of energy in the general environment.

2) the nature and level of energy generated in the general environment must be modified (increased, decreased, rechanneled) prior to goal attainment.

3) the nature and level of total environmental energy has little effect upon goal attainment (goal attainment is primarily affected by decoder activity.)

In order to test these hypotheses, the SEA planning unit will identify a number of force field factors pertinent to this type of problem which operate in the environment energy-information feedback loop. Let us say the planning unit identifies the force-field factor (y), as a coefficient of personal (family) expense divided by personal (family) income, as the one which is operational for the problem in the example. When personal expenditures are higher in relation to personal income, or increase when personal income is fixed, the coefficient y is larger than when personal income exceeds personal expenditures or increases in relation to personal expenditures. The relative value of y can be plot-

ted over a period of time during which the SEA has in the past attempted to achieve similar goals. A statistical correlation may be made for the plotted values of y with the level of degree of success of goal achievement experienced by the SEA in the past when certain types of feedback information were evident in the environment information feedback loop. If there is found to be a positive or negative correlation, critical levels of y may be ascertained for a variety of types of feedback information. The critial levels of y thus identified may be utilized by a planning unit in inferring the effects which certain types of information fed-back to the whole environment might have on the success or failure of goal attainment by the SEA. The types of feedback information thus identified may be utilized by the SEA in the selection of the kinds of activities in which it should engage in order to optimize goal attainment that is dependent upon environmental energy. Such activities referred to as 'testing methods' on page 30, catagorized in model compatible terms, may be defined as:

Shunts: activities which are designed to lower the energy potential which specific RWE elements may contribute to the defeat of the attainment of desired SEA goals.

Valves: activities that are designed to regulate the flow of energy of elements in the RWE, to best attain desired SEA goals.

Switches: activities to direct the energy of combined elements in the RWE for the purpose of providing selective impetus to the attainment of desired SEA goals.

Another parameter of information to be considered in the example cited above is, if an identified force field factory y is found to be

critical, it may be reasoned that information that is fed into the transducer from a correlated encoder information source will have a modifying effect on the energy emanating from the general environment. This modified level of energy may be designated z=Cy, with y designated as any real number larger than 0 and up to but less than 1. The constant C is designated as any hypothetical number greater than 1.

This model concept allows planning units to make some judgements concerning how total environmental energy may affect resources from one period of time to another. For instance, empirical evidence indicates that during periods of time when the status of level of well-being of the individuals in the general environment is threatened to a high degree, as in times of general retaliatory war, economic depressions, or fear producing dramatic incidents, such as the launching of Sputnik I, the relationship of z to y in the allocation of resources to education may be parabolic in that $z=C(y^2)$, while at other times, at the general level of environmental energy, the relationship of z to y may be linear, in that z=Cy. The planning unit in noting such differences may be able to provide educational decision makers with limited projections concerning the potential energy of the general environment for goal attainment. Such information may prove to be of value in determining the proper timing and general scheduling for the initiation of a variety of activities directed to SEA goal attainment.

If the planning unit finds in its analysis of a hypothesized force field factor, that no correlation exists, other force field factors would be tested. If no correlation exist for these as well, it may indicate

that the SEA activities should be directed to the decoder element of the environmental system, for example, activities designed to sensitize decoder activity to environmental energy.