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FINAL REPORT

USERS ADVISORY COUNCIL

ASSISTANCE PROJECT

by

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1. Introduction

Computer data processing is fundamental to the efficient operation of large state agencies. Over the last decade, data processsing applications have been implemented and interwoven into the daily activities of a majority of the employees of these agencies. Data processing is a substantial portion of the operating budget of many such agencies. Additional resources, many not directly accounted for, are expended in the development of data processing applications.

Under state law, the Commissioner of Administration is charged with "the integration and operation of the state's computer facilities serving the needs of the state government" [MS16.90s1]. In the process of discharging that statutory responsibility, the Department of Administration, through its Information Systems Division (ISD), has become the custodian and repository for much of the state's information resource. The statutory authority assigned by 16.90 and other legislation has positioned ISD as not only the custodian of resources and the provider of service, but as the regulator of the quality of service and of the applications to be implemented.

As the technological evolution continues, the range of activities which can be supported by computer systems is expanding rapidly and the cost of computing equipment is continuously decreasing. Data processing systems and information systems that were once considered the esoteric domain of a relatively small proportion of technically trained specialists have become familiar objects of routine interaction to a majority of state employees. This familiarity has removed some of the mystique once associated with the computer. It has opened computing, data processing, and information systems to criticism from every level. Users who once accepted data processing's prescriptions without question feel increasingly (but perhaps naively) that they can do as well, or better, given the opportunity, than the professionals.

User sophistication results in increased demand for computing services. User demand is not for just more processing capability, but for larger, more complex information systems. Such systems require not only more development time and resources, but much more care to assure proper integration and to maintain system integrity. The service function thus appears to lag demand at an increasing rate. At the same time, the regulatory function of ISD appears more negative.

This environmental change has generated organizational conflict between the information systems organization, ISD, and users who perceive a need for more and better service which must be provided through ISD. It is not surprising, then, that:

1. Legislation pertaining to changes in ISD's form or function is regularly introduced,
2. A qualified Director of ISD cannot be retained,
3. User groups (Systems Advisory Committee [SAC], User Advisory Council [UAC], State Information Systems Advisory Council [SISAC]) are being activated or reactivated,
4. Steps toward decentralization via hardware "distributed data processing" are being considered by user agencies and ISD,
5. ISD employees, perceiving themselves to be under a state of seige, are leaving state employment at increasing rates.

Recognition of the problem, the increasing inability of ISD to meet user agency demands, is universal. Prescriptions intended to alleviate or solve the problem are many and varied. While a consensus is not apparent, most perceptive commentators lean toward some form of organizational change. Such a change is supported in the study of organizations, e.g., Lorsch and Allen [1] confirm in their study that performance is related positively to the fit between the organization and its environment.

Recognition of the need for organizational change is not sufficient, by itself, to guide such change. Critical to the reshaping of the information systems service organization is sound knowledge and judgment of future information needs.

Involvement on the part of user agency heads and upper level managers is needed because:

1. The state's pool of managerial talent is concentrated in this group,
2. Agencies are the first to be aware of substantive deficiencies in information service,
3. The missions of agencies are increasingly dependent upon the products of information services, and,
4. Plans for performance of agencies' missions must include plans for information systems.

There is thus a clear need for agency management participation in the resolution of the information systems problem.

The nature of user agency management involvement is not so clear. There are many roles which might be adopted. Discussion by the Users Advisory Council over the past year, discussions and analysis by ISD management, and research by the authors of this report all indicate:

1. Need for participation in long-range planning for information services,
2. Need for two-way communication of concerns, problems, and solutions between users and ISD,
3. Little need for involvement at the technical level,
4. Need for overall guidance and direction -- policy.

This paper addresses the need for the formulation and implementation of policies which will guide and direct ISD, and will increase and maintain its congruence with the rapidly changing environment. The authors' involvement began in June, 1978 with a concern on the part of user and ISD managers over the impact of a particular aspect of new technology, "distributed data processing." While

working under contract with ISD to develop a seminar on distributed data processing (presented in November and December, 1978), the research team became aware that technological concerns and problems were symptomatic of the larger problem. Partly as a result, the seminar dismissed technological and economic aspects of distributed data processing as relatively unimportant, and concentrated on the managerial aspects of policy formulation, planning, and control of information services.

Subsequently, the authors were engaged by ISD to assist in the establishment of an effective User Advisory Council. This paper is a result of, and the final report, on that activity.

A thorough search of the literature relevant to policy formulation in both the public and private sectors, and a thorough review of the information systems planning field were conducted. The results of that research are reported in Section 2 of this report, and in an annotated bibliography of the policy literature, Appendix 2.

A model for information systems policy, supported by recent research, and by the activities of members of the Users Advisory Council and the authors, is presented in Section 3. This policy framework is a model for the interactions of the user manager community with ISD.

A questionnaire survey of other states information services policy formulation processes, and of the role of user managers in such policy formulation was conducted and is reported in Section 4.

2. Policy Formulation

This section reports on analyses of the process by which an organization formulates policy. The primary focus of analysis was the manner in which users of a support organization may be involved and considered responsible for advising and guiding the direction and operation of that functional entity which serves them.

A review of the literature reveals that there are virtually as many concepts of what is meant by policy and the process of policy formation as there are writers in the area. Due to this lack of consensus, it is necessary to define what is meant by such terms in the context of this analysis. In general, policies are guides to action directed toward the achievement of an objective or goal [2]. As an objective is attained, other policies direct action to the achievement of new objectives. In this fashion, a hierarchy of policies and objectives is created that leads an organization of the fulfillment of opportunities or the resolution of threats [3]. Because an organization exists in a dynamic environment, it is necessary to continually identify challenges and opportunities. The success of an organization depends on how well it formulates its policies in light of its dynamic environment, how well it designs and articulates its policies, and how well it assures their implementation [4]. This continual process requires that an organization:

- define its missions
- broadly state its objectives
- determine what actions are necessary to met these objectives
- develop and allocate human, physical, and financial resources
- evaluate the results
- take corrective action when necessary
- generally structure inter- and intra- organizational relationships to facilitate the accomplishment of desired performance levels [5]

An understanding of this strategic management process is necessary to the definition and development of the potential role of UAC as an advisor to ISD.

The relationship of an organization to its environment has been a major interest of writers in the field of management. It was initially believed that an organization did little more than react and respond to the environmental conditions in which it found itself. Early research efforts were concerned with identifying those environmental factors which shaped organizational behavior [6]. More recently, however, the emphasis in research has shifted to recognition that an organization does not merely react to its environment, but interacts with it. March and Simon concluded that because human beings are limited in their ability to act rationally in making decisions, organizational structures and processes evolve to protect the organization from becoming overwhelmed by its limitations in these areas [7]. Cyert and March concluded that in setting policies and procedures to reduce environmental uncertainty, managers effectively constrain themselves from searching for solutions to perceived problems in areas beyond their familiar frame of alternatives [8]. In viewing the structure and processes of an organization as influences narrowing the view of problem solvers, Cyert and March attempted to demonstrate that structure constrains strategy.

In contrast, Chandler cogently discussed the manner in which strategy impacts structure. Chandler defined strategy as "the determination of basic long-term goals and objectives of the enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals" [9]. Although Chandler does not define a simple causal link between strategy and structure, it is his assertion that structure tends to follow strategy and that the two must properly be aligned for an organization to be effective [10]. This view differs from that of the March and Simon school that an organization is hindered in its attempts to move in different directions unless substantial structural alteration takes place [11].

Although divergent in this fashion, both views are consistent in the belief that strategy and structure are situationally specific. The formulation of policy is viewed as a negotiation process that concerns environmental demands or requirements, coalitions of interested parties, and the self interests of policy makers. The competition of these varying interests has been perceived as giving rise to a managerial style characterized as a "muddling through" process [12].

Recent research has more systematically examined the formulation of organizational strategy to develop a theory of process. Studies of this strategic process have examined the influence of long-range planning on organizational performance [13]; the impact of an incremental approach to policy making on budgeting [14]; strategic decision-making activity among members of the dominant coalition [15]; and the relationship between managers' personal values and strategy [16]. Contingency theorists are of the view that organizations try to identify homogenous segments of the environment and to establish specialized structural units to deal with each. In general, the efforts to develop models that define the issues and procedures of policy and strategy formulation continue to recognize the necessity of situational modification. Increasingly, the importance of management is perceived to be its capacity to link the organization and its environment. The basic function of management is to maintain the alignment of three dynamic elements: the environment, organizational structure, and technology. It is the strategic planning process that determines the basic thrust and direction of the organization. It is apparent, however, that there is no one, particular means by which organizational policies and strategies are formulated.

Review of the Management Information Systems literature produces little of direct use to this study. Specific discussions concern the need for strategic planning, but not the process according to which it should be accomplished.

The literature has been enamored with technological characteristics, the potential, and the limitations of the information systems resources [17]. Interest is also evident in the acquisition of resources, their maintenance, and their conservation [18]. Application and integration of resources are yet other well analyzed issues [19]. Although an essential executive function is recognized to be the formulation of the purposes of the information system, assistance to this function is perceived to be provided by specialized staffs that can simplify technological and operational complexities [20], release executives to more managerial activities [21], and allow efficient allocation of specialized skills to all parts of the organization [22].

Rapid economic and organizational growth has been accompanied by technological advances that have resulted in an increasingly significant role of the data resource as an aid to decision-making. As a consequence, innovations in organizational structure have occurred to exploit data resources. However, the literature provides but a cursory discussion of the process by which such beneficial exploitation takes place. Research issues are more concerned with the shift in status of data from something the computer uses to recognition as a valuable resource that is to be shared. This shift in status has given rise to issues relating to the collection of data, determination of the responsibility for data, control of the data, and the assessment of user interfaces [23]. In each instance, broad organizational implications are recognized but not fully analyzed. Primary interest focuses on what it means to treat data as a resource and not on issues which are of our interest here.

In a manner similar to the management literature, research in the MIS area has been concerned with the identification of influential factors of the computer resource to which management should react. Nolan's four stage hypothesis describes the nature of planning, organizing, and controlling the resources

associated with use of an information system [24]. The literature generated as a result of this framework for analysis is extensive and deals with a variety of fields ranging from psychology and sociology to organizational theory.

In general, computers have increasingly been recognized as necessary to top management decision-making. However, consideration given to the manner in which policies for the use of the information systems resources are formulated has been deemed more the domain of managers and analysts than the concern of users [25]. In developing models of resource use, managers and analysts recognize the need to understand users but fail to include them as participants in the strategy formulation process. Where it is advised that users should be consulted in an effort either to expose the planning process to new ideas or to fulfill a desire for collaboration, the suggested contact takes the form of presentations to steering committees, lunches with key members of user management, or joint discussion with users [26]. The MIS literature recognizes the need for planning and articulates its concepts in language nearly identical to that of the management literature. Ideal planning combines the efforts of management, line, and staff; considers both external and internal systems; defines purposes, structures, and contents; and evaluates the present structure and uses of the potential system [27].

The question of how users should guide and advise the information systems function is at the conceptual forefront of the literature. It is clear from a review of the available literature that a good deal of information pertains to what activities are involved in strategic planning. Unfortunately, a paucity of information exists that pertains to the actual process. It is possible to identify normative procedures based on existing information that would be situationally modified to the needs of the state's ISD. A model can be developed to deal with the particular problems encountered in strategically planning for the

information systems function in a governmental environment. Such a model must especially deal with the unique problems of short time horizons, a multitude of special interest groups, and a hesitancy to make decisions. As in the private sector, the growing significance of environmental changes on governmental organizations has resulted in an emphasis on an organization's adaptability to change as a measure of organizational effectiveness [28]. The increased sophistication of users of the information systems function in combination with their existing awareness of needs and environmental influences makes the only sensible course the utilization of users as a guiding and advising entity to the formulation of strategy.

3. A Policy Model

Effective performance of the information systems function is vital to attainment of agency missions. Agency management cannot permit information systems objectives and strategies to be set without their participation. Many management decisions about information systems require some or even a great deal of technical knowledge and experience. But many more require management knowledge and experience, and understanding of line agency goals, objectives, problems and plans.

Without thoughtful and informed guidance from their user community, ISD management must independently assess agency needs, estimate the impact of their decisions upon agencies, and allocate scarce resources to satisfy competing demands for services.

Policy Needs

The literature on policy is complex, theoretical, and difficult to operationalize, as Section 2 of this report reflects. Distinctions between such terms as strategy, goals and objectives, long-range planning, and the like often appear to be merely semantic gamesmanship. The lack of clear definitions of the term "policy," and of the related terms, strongly indicates the need for a group which can define specific terminology to be used in this environment.

The need for policy for ISD is more than a need for consistent terminology, however. Decisions concerning the level and quality of service, and management of the resources to provide that service, are made by many different individuals at different levels of the organization. Without a clearly defined and widely understood framework for decision making, consistent, coordinated decisions are unlikely.

It is in this aspect, as a framework for decision making, that ISD's need for policy is most apparent. ISD's environment has changed and is continuing to evolve. The impact of that change, which includes user's perceptions of new needs for information and data processing services, needs to be reflected in policy. Guidelines for management decisions concerning the type, level, and quality of services to be provided, and for acquisition and allocation of the resources necessary to provide those services, also need to be reflected in policy. Finally, guidelines to evaluate performance and make corrections where necessary should be embedded in policy.

In summary, there is a need for articulated policy which provides guidelines for management decision making in ISD.

The Policy Group

The policy literature analyzed in this research was primarily oriented toward strategic management in the private sector. There is no prescription for policy formulation for a service organization within a larger organization. The relevant information systems literature is primarily concerned with planning for integrated applications, and management of the data resource. Provision of these services and attainment of the missions of the organizations served are assumed to be congruent. This is a somewhat myopic, self-centered view, i.e., that users are best served by increased use and coordination of information systems. This body of literature suggests "user involvement," but does not specify the nature of such involvement.

There are a number of alternative possible policy groups already in existence, including:

- Department of Administration Management
- The Systems Advisory Committee (SAC)
- The State Information System Advisory Council (SISAC)

These groups are unquestionably involved in information systems policy formulation, but each has constraints.

The Department of Administration and its Information Systems Division has responsibility for all information services. It is the logical repository for technical information processing expertise. Managers in this organization, however, cannot be expected to fully understand the evolving needs of user agencies.

Similarly, the Systems Advisory Committee is composed of technically qualified individuals who represent supporting functions of user agencies. Members of this group can be expected to know more details of user agency needs. Their focus, however, is towards current projects and problems, and less toward the evolving missions of their agencies.

The State Information Systems Advisory Council is composed of representatives from other organizations. SISAC can be expected to be very knowledgeable about the management of the information systems function, but not of the user agencies missions.

The common deficiency in these potential policy making groups is a lack of knowledge of user agencies. The User Advisory Council (UAC), on the other hand, is composed of first and second level managers in user agencies. Their line responsibilities include planning and controlling their agencies' information processing. In addition to knowledge of the user environment, UAC includes or represents much of the State's top managerial talent. UAC is thus uniquely qualified and organizationally positioned to provide policies which are a framework for making decisions about information services.

The UAC charter [Appendix 3] was developed by a working task force of UAC with the assistance of the authors, Department of Administration and ISD managers,

and members of the Systems Advisory Committee. The charter prescribes the purpose and scope of the User Advisory Council. In particular:

> "The UAC will recommend policies for the management of the application development process and the operations process. The UAC will recommend policies for the resources required in development and operations: data, equipment, people and applications."

The Policy Formulation Process

The creation and articulation of policy statements is defined in the literature as a function of strategic management. There are parallels for a group such as UAC performing a policy making role, for example:

> "The Director of Automation... is responsible for the review of the whole [automation] program, and for the allocation of resources. Advising him is an Automation Steering Committee which consists of generals representing all of the major functions of the Army. This steering committee acts like a board of directors for the Director of Automation. The committee is responsible to the senior Army leadership for overseeing the entire automation program." [29]

An obvious difference is that the Commissioner of Administration, not UAC, has statutory responsibility for the "entire automation program." In so far as the Commissioner has delegated his authority to the UAC, however, UAC's role is similar to that of a board of directors, and includes identifying issues, formulating policy, and articulating needs.

Policies may be developed either in response to critical issues, or more comprehensively, in anticipation of problems. In the past, articulation of a clear, comprehensive set of policy statements has not been accomplished. One reason for this failure has been the tendency to focus on particular current issues. Policies that result from such an approach have a tendency to be specific and isolated. The need for comprehensive, pre-active (rather than re-active) policy statements is apparent if such policies are to provide a framework for management decision making.

The process of policy formulation can be structured as follows:

1. Construct an inclusive classification within which the applicable decision making is to be carried out.

2. Define for each classification, the scope of management decision making.

3. State the management objectives of each classification.

4. Formulate policy statements which will guide decision making in each classification.

5. Review and inspect each policy statement to ascertain that it is general and far-reaching but that it does provide guidance for management decision making.

6. Review all policy statements in each classification to assure consistent and comprehensive policy articulation.

7. Review all policy statements to assure consistency. Adjust statements to deal with overlapping and conflict between classifications.

8. Establish procedures for decision review to monitor use of and compliance with established policy.

9. Review and revise policy statements when conflicts arise and as the environment changes.

These steps can best be accomplished by forming working subgroups of UAC, and providing additional resources, both from ISD and user agencies to assist. Step 7 should be addressed both by joint working groups and the full Users Advisory Council.

Policy Classification

Initial UAC subcommittees, in the period of November 1978 through March 1979 studied and adopted the classification presented in the Distributed Data Processing Seminar. This classification is reflected in the UAC Charter scope statement. All information processing policy within the statutory responsibility of the Commissioner of Administration is classified as either a Process or a Resource. The second level of classification identifies two processes: Systems Development

and Operations. Four resources are used in these processes: Equipment, Data, People, and Applications. An additional process and resource is not separately classified: Management. Management was purposely left out since the focus of policy, and of UAC, is management decision making. That is, a policy dealing with equipment addresses management decisions about equipment, not specific units.

The initial definition of the scope of each policy area is:

1. Resources

1.1 Equipment. The scope of equipment considerations is limited to the following areas of concern:

1.1.1 Processing resources are capital resources which are embodied in hardware, software, or both, and which have the primary function to enter, transform, store, or retrieve data either directly or under control of an application program. Processing resources include mainframes, peripherals, systems software, terminals, and word processing.

1.1.2 Network is all equipment, hardware, software, or both, purchased, leased, or rented, which has a primary function related to the communication of data between persons or processing resources. Networks include network architecture, terminals, protocols, and communications equipment including front ends, multiplexors, modems, and lines.

1.1.3 Equipment resource management is the forecasting, planning, procurement, inventory management, performance reporting and evaluation for all processing resources and network equipment.

1.2 Data. Data resources are defined as machine readable records and data items under the control and supervision of state agencies. Excluded from this definition are

1. data residing on source documents, work sheets, and other transaction written material;

2. records management and other procedures for controlling paper documents;

3. data information residing in local governments and other non state entities including the University of Minnesota.

1.3 People. The scope of this are includes employees assigned to the information services division, employees working in classes bearing EDP titles, and employees working in assignments primarily associated with data processing even though not organizationally part of a data processing unit or not in classes designated by a data processing title. The people area includes personnel planning, training, career growth, recruitment, selection, organizational location, classification, performance evaluation, and salary administration.

1.4 Applications. The scope of the applications resource area considers computer applications, or systems, as substantial investments of the state's resources which must be managed as resources. Such management includes project selection, the make or buy decision, assignment or commitment of resources, inventorying and accounting for installed applications systems, and periodic review and audit.

2. Processes

2.1 Development. Development is the process of applications analysis, definition, and design, program and procedure design, and construction, testing, training, documentation, and installation. It includes systems development methodology, project management, user liaison and involvement, functional specialization, and organizational location.

2.2 Operations. The scope of the operations process includes considerations of distributed processing, remote job entry equipment, standards for acceptance of new applications, and quality control over operations production. It also includes such issues as physical location and security for operating equipment, user, operating, and maintenance documentation, maintenance of systems software, applications and hardware, and such service issues as pricing, scheduling, delivery, and problem resoultion.

The Policy Environment

A set of policy statements can be formulated, adopted, and promulgated by the Commissioner of Administration. Procedures for monitoring the implementation and effective use of UAC policies can be established. That is a necessary but not sufficient role for UAC as an "Information Systems Board of Directors." UAC, as the initiator of information systems policy, is uniquely qualified and positioned to perform two additional and vital functions.

The first of these is to serve as a focus for long-range planning. There are substantive questions involving a time horizon of greater than 5 years, that require informed judgment and knowledge of user agency goals and of the broad scale of technological evolution. UAC should work with other groups including Department of Administration managers and specialists, interested legislators, and SISAC members, to define these questions and help establish long range goals for the state's information resources.

The second role which UAC can uniquely serve is communication. Many of the past and present problems attributed to ISD can be alleviated by better communications and a wider understanding of the nature of information systems and services. By communicating policies, strategies and objectives to their home agencies and others, UAC members can help assure that plans for the "integration and operation of the state's computer facilities" are perceived as congruent with the state's goals.

4. Information Systems User Management Participation Study

A survey of state information systems processing organizations was conducted to assist the determination of "how the users of an information systems function may effectively guide the direction and operation of a state information system." The survey was intended to assess and describe the policy formulation process, and the role and levels of involvement of user/managers in determining policies for information processing. Of 49 questionnaires (Appendix 4) mailed to directors of state information processing functions, 29 were returned. The 59% response rate indicates a high level of interest.

Twenty-one (72%) of the responses affirmed the existence of an established group that interacts with the state's data processing organization to direct growth, development, and performance of the information processing activities in the state. The eight responses that did not affirm the existence of such a group indicated that policy was formulated within the regular organization structure by managers who were knowledgeable about user agency goals, objectives, and activities (Q2,4). This group was evenly divided on technical knowledge (Q3,5).

States with policy groups were divided on the composition of those groups. Eight groups consisted of managers in user organizations, eleven of managers in data processing, and two had both (Q21). In the analysis that follows, the ten groups which included user managers will be referred to as user policy groups; the eleven with managers in data processing will be referred to as DP policy groups.

- User policy groups meet less regularly than DP policy groups; seven (70%) meet only irregularly while 73% of DP policy groups meet monthly (Q20).

- Neither policy group was particularly concerned with equipment. Three user policy groups and only one DP policy group develop guidelines for equipment location, a total of 19%. This response rate perhaps indicates that the current distributed data processing furor has not yet been institutionalized.

- Slightly less than half (43%) of each group establishes equipment selection guidelines.

- User policy groups are much less concerned with training and career paths for data processing personnel (Q19), 20% versus 91% of the responses indicated this concern. This is not an unexpected difference, but does indicate a difference in perception of policy needs.

- With respect to management of the data resource (Q10), and data control (Q13), little difference between groups was observed. Sixteen (76%) develop data resource management guidelines and eleven (52%) develop data control, security, privacy, or retention guidelines.

- Two questions assessed concern for policies concerning the applications resource (Q8,12). Four of each type of group (38%) select appplications for development; six of each discuss and coordinate user needs and priorities.

- Only one question (Q16) addressed the operation process. Seven (33%) of the policy groups monitor operations performance. There was no difference between user and DP policy groups on this question.

Four questions concerned various aspects of policy for the systems development process. The groups differ significantly in their views of this area.

- Eight (73%) of the DP policy groups specify or prescribe development methodologies (Q14) while only two (20%) of the user policy groups do so. Similarly, eight DP groups but only three user groups develop guidelines for standards (Q18).

- Neither group was particularly concerned with the organizational location of systems development (Q11); only three of twenty-one (14%) responded affirmatively.

- There was a slightly higher concern for performance monitoring in the applications development process (Q15), but only three of each type (29%).

Table 4.1 shows the response proportions for each policy area, and differentiates user policy groups from DP policy groups. (The development process has been divided into concern for methodology and standards versus concern for location and performance monitoring.) Aside from what is obviously the primary concern of these policy groups, establishing goals and objectives for planning

Policy Area	Type of Policy Group		
	USER	DP	TOTAL
Goals and Objectives	90%	91%	90%
Equipment	35	27	31
Data	60	68	64
People	20	91	57
Applications	50	45	48
Operations	30	36	33
Development method	25	73	50
Development control	25	18	21

TABLE 4.1

Survey Responses by Policy Area

and control, management of the data resource is of highest concern, with nearly two thirds of all policy groups responding affirmatively to these questions.

The two types of groups, composed of managers based either in user agencies or data processing, differ very little in their policy concerns. DP policy groups evidence a high degree of concern (91%) for DP career pathing and training, compared to only 20% of user policy groups. This is not surprising, but may imply that decentralization of DP personnel carries some risk.

The other significant difference between the two groups is the high degree of concern (73%) DP policy groups for systems development methodologies, standards and controls. Only 25% of the user policy groups were concerned about this policy area.

The results of this study indicate a high degree of awareness of the need for information systems policies to be established by a representative group. Nearly three-fourths of the states responding to this survey (and nearly one-half of all states) report such a policy group. Their concerns are broad, and appear to reflect a common concern for information aspects of data procsesssing, i.e., data, people, development and aplications, rather than equipment or operations.

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Emphasize strategic management as distinct from operational management. Define strategic management as the process of determining and maintaining the relationship of the organization to its environment through use of selected objectives. Desired states of relationship are achieved through resource allocations which allow efficient and effective action program by the organization.

Organ, Dennis W. "Linking Pins Between Organizations and Environment," Business Horizons , December 1971.

The more relevant criterion of organizational effectiveness is not, as it used to be, that of efficiency, but rather that of adaptability to changes in the environment .

Boettinger, Henry M. "The Management Challenge," in Edward C. Bursk (ed.), Challenge to Leadership, New York, Free Press, 1973.

Businesss or managerial leadership is judged not by tactical nimbleness but by the robustness of the strategic decisions for the organizations they head.

Zand, D. "Policy Formulation and Managerial Behavior," New York University Working Paper No. 72-22, 1972.

A study of a large research and development company suggests that freedom to depart from formal planning procedures improves management's ability to contribute strategy recommendations.

Miller, E. C. Advanced Techniques for Strategic Planning, AMA Research Study 104, New York, AMA, 1971.

A survey of 40 U.S. companies indicates that 30% use general statistical decision-making procedures for planning purposes. Study provides many examples and ideas for such uses.

.Dallsey, N. C. The Delphi Method: An Experimental Study of Group Opinion, Rand Corp., 1969.

Explains this decision-making technique designed to gather consistent expert opinions from group members to arrive at a consensus concerning an issue.

Hall, W. K. "Strategic Planning Models: Are Top Managers Really Finding Them Useful?" Journal of Business Policy, 3:2, 1973.

Another in the long lines of articles questioning the ability of the management science expert to explain to non-management science persons the potential of its methods.

Steiner, George A. and John B. Miner. Management Policy and Strategy (text), Macmillan Publishing Co., Inc., 1977.

The organizing framework of this book is the formulation and implementation of strategy and policy. The objective of the book of to increase understanding of the central significance of policy and strategy to top management and their organization. This includes the ability to evaluate the environment, to determine missions and objectives, to formulate and evaluate the best policies to achieve these ends, and to assure that policies and strategies are implemented. Each of these areas of consideration is analyzed in depth. Primary focus on business organizations.

Summer, Charles, E. Jr. and Jeremiah J. O'Conell. The Managerial Mind, Irwin, Homewood, Illinois, 1964.

Scientific research findings and theories have great potential power in decision-making, but they also have serious, sometimes even dangerous, limitations for managers who must make decisions in large complex policy systems.

Patz, Alan L. "Notes: Business Policy and the Scientific Method," California Management Review, Spring 1975.

The scientific method is applicable to a well-developed policly and strategy formulation and implementation process.

Brown, James K. and Rochelle O'Connor. Planning and the Corporate Planning Director. New York, National Industrial Conference Board, 1974.

A survey (N=111) asked corporate planners to define strategy. The result was a definition that strategy includes the determination and evaluation of alternative paths to an already established mission or objective and, eventually, choice of the alternative to be adopted.

Gross, Bertram M. The Managing of Organizations, Free Press, New York, 1964.

An extended discussion of the semantics of the words strategy, policy objectives, goals, mission, etc.

Appleby, Paul H. Policy and Administration, University of Alabama Press, University, Alabama, 1949.

Everything decided at a particular managerial level, and above, is policy. Everything below is administration.

Drucker, Peter F. Management: Tasks, Responsibilities, Practices, Harper and Row, New York, 1974.

No prescribed set of top management functions performed uniformly throughout industry. There are prescribed top management tasks, but these vary from one organization to another. These tasks are unique to top management of public and private organizations and include maintaining the human organization, assuring proper relationship between top managers and others such as government, suppliers, banks, ceremonial functions, crisis management.

Miles, Raymond E., Charles C. Snow ands Jeffery Pfeffer. "Organization-Environment: Concepts and Issues," Industrial Relations, October 1974.

A review of the literature that interrelates environment and organizational structures. Helpful as background to organizational-environmental interaction, but not predictive of policy/strategy formulation and implementation processes in particular situations.

Chandler, Alfred D. Strategy and Structure: Chapters in the History of the American Industrial Enterprise, MIT Press, Cambridge, Mass., 1962.

The first major analysis of the interrelationships among environment, strategy, and structure. He concluded, upon analysis of 50 companies, that strategy was directly related to the application of an enterprise's resources to market demand. This relatedness resulted in major changes in organizational structure.

Lawrence, Paul R. and Jay W. Lorsch. Organization and Environment: Managing Differentiation and Integration, Harvard University, Graduate School of Business, Boston, 1967.

Demonstrate convincingly that environment affects the subsystems of an organization differently. If an organization is to be effective, each of the subsystems must react appropriately to its environment, and they all must be properly integrated as they discharge their roles in different ways as determined by the environment.

Perrow, Charles. "The Short and Glorious History of Organizational Theory," Organizational Dynamics, Summer 1973.

Reviews research on organization theory and concludes that as the growth of the field has forced ever more variables into our consciousness, flat claims of predictive power (how organizations respond or react to environmental influences) are beginning to decrease and research has become complex.

Salveson, Charles B. "The Management of Strategy," Long Range Planning, February 1974.

Strategic plan includes: (1) a statement of mission; (2) key environmental assumptions summarizing the external environment, its opportunities, and its threats; (3) key competitor assumptions; (4) constraints either internally or externally imposed; (5) objectives; (6) goals -- specific time-based points of measurement that will be met in attaining the objectives; (7) strategy -- the course of action to be taken to achieve objectives; (8) the program (development and investment) critical to the strategy; (9) required resource; (10) contingency plans; (11) financial indications of elements in strategic plan that allow integration with operational control system.

Gerstner, Louis V. "Can Strategic Planning Pay Off?" Business Horizons, December 1972.

Following the identification of alternative policies and strategies, decision-making requires evaluation and choice. Decisions are not make because they are: (1) risky; (2) strategic planning is creative in nature and is independent of the type of thinking and breadth of knowledge required to advance in functional areas; (3) controversial, requiring leadership; (4) promotion and evaluation systems work against the making of decisions -- managers usually are short-run oriented.

March, James G. and Herbert A. Simon. Organizations, Wiley, New York, 1958.

Previous to this book, classical economic theory dominated organizational theory. Core concept of classical economic theory is that firms operate rationally when seeking to maximize profits under conditions of comprehensive rationality. March and Simon view organizations as coalitions of participants with different motivations and limited ability to solve all problems simultaneously. Goals are formed in light of such constraints and achieved through a bargaining process.

Allison, Graham T. Essence of Decision: Explaining the Cuban Missile Crisis. Little, Brown, Boston , 1971

A complete description of organizational, decision-making models. He differentiates between the "Rational Actor," "Organizational Process," and "Governmental Politics" models. The first is patterned after the classical economic model, the second sees organizations as composed of different units that have their own way of doing things, the third views organizations as institutions that get things done through political processes.

McKenney, James L. and Peter G. W. Keen. "How Manager's Minds Work," Harvard Businesss Review, May-June 1974.

Managers engaged in policy formation should benefit most from using the more rational, less emotional systematic style than from use of intuition. A systematic style involves: (1) looking for an explicit method of problem solving and making a plan of approach; (2) defending solutions primarily in terms of the method used to reach them; (3) defining constraints on what can be done at the beginning and discarding alternatives quickly; (4) moving through a process that involves increasing refinement of analysis based on a systematic search for relevant information; (5) not leaving things hanging, but rather completing all analytic steps that are begun.

Van de Ven, Andrew H. and Andre L. Delbecq. "Nominal Versus Interacting Group Processes for Committee Decision-Making Effectiveness," Academy of Management Journal, June 1971.

It appears that the usual group discussion or meeting has the effect of inhibiting creativity; the group context does not permit realization of the full idea-producing potential of all the people participating. Reasons: focus narrows, hesitancy to participate, inhibition, pressures for conformity, individuals may dominate and monopolize.

Gustafson, David H., Ramesh K. Shukla, Andre Delbecq and G. William Walster. "A Comparative Study of Differences in Subjective Likelihood Estimates Made by Individuals, Interacting Groups, Delphi Groups, and Nominal Groups," Organizational Behavior and Human Performance, April 1973.

Once an idea base has been generated, groups provide needed arguments regarding feasibility and profit potential, etc. This kind of evaluative input to the decision process can be effectively developed through discussion. Group members may well stimulate each other and a general searching out of new information tends to occur. Groups well serve judgmental purposes.

Janis, Irving L. Victims of Groupthink, Houghton Mifflin, Boston, 1972.

The more friendly and close the members of an in-group, the greater will be the chance that independent critical thinking and realistic moral judgment will be suspended in favor of group norms and convivality. This is called groupthink, with the following consequences: (1) a belief in group's basic morality; (2) stereotyped outlooks; (3) sense of invulnerability; (4) discounting outside opinions; (5) pressure to avoid expressions of opinion that are contrary to groups position; (6) self-censorship; etc.

Cummings, L. L., George P. Huber and Eugene Arendt. "Effects of Size and Spatial Arrangements on Group Decision Making," Academy of Management Journal, September 1974.

Debates how large committees should be, how many people should serve on boards of directors, etc. Answers are tied to the nature of the decision to be made and the effects of similarities and differences among group members.

Hofer, Charles and Dan Schendal. Strategy Formulation: Analytical Concepts, West Publishing Company, 1978.

A study of the functions and responsibilities of top management, together with the organizational processes and systems for formulating and implementing organizational strategy.

Lorsch, Jay W. and Stephen A. Allen, III. Managing Diversity and Interdependence: An Organizational Study of Multidivisional Firms, Harvard University, Graduate School of Business Administration, Boston, 1973.

Confirms Lawrence and Lorsch's earlier findings. Major findings: (1) the greater the differentiation among interdependent functional units, the greater is the problem of integration -- but the higher the quality of integration, the better is the performance of the organization; (2) within divisions and at the corporate level, the more complex the pattern of interdependence, the more complex the integrative devices will tend to be; (3) where there exist appropriate patterns of integration and differentiation, information flow will be of higher quality; (4) economic performance is related positively to the organization-environment fit.

Argyris, Chris. The Impact of Budgets on People, Controllership Foundation, New York, 1952.

A lack of participation in the budget process results in very low levels of commitment to achieve budget targets. (Indicates relationships between participation and goal setting.)

Argyris, Chris. Intervention Theory and Method, Addison-Wesley, Reading, Mass., 1970.

Advocates participation as the answer to the implementation problem. The way to get people to accept a decision and have a desire to implement it is to involve them in the decision-making process.

Vroom, Victor H. and Philip W. Yetton. Leadership and Decision Making, University of Pittsburgh Press, Pittsburgh, Penn., 1973.

Report that managers use participation more, thus engaging their subordinates in the decision-making process when they forsee problems in getting a decision carried out.

Cartwright, John. "Corporate Planning in Local Government-Implications for the Elected Member," Long Range Planning, April 1975.

Explains how corporate long-range planning processes apply to local governments. Major differences between government and business decision-making is the total consideration of politics rather than consideration of politics and economics.

Lindbloom, Charles E. "The Science of 'Muddling Through'," Public Administration Review, Spring 1959.

Policy making is a process in which something is tried, altered, tried again, etc. All the while, policy makers seek compromises with powerful interest groups until the bargaining process produces a result acceptable to all having power or until those who are dissatisfied are unable or disintersted in obstructing a decision.

Paine, F. T. and C. R. Anderson. "Contingencies Affecting Strategy Formulation and Effectiveness," Journal of Management Studies, May 1977.

A study of 62 cases involving a variety of organizations and environments in which it was concluded that successful organizations tended to follow a strategic mode appropriate for the perceived conditions.

Khandwalla, P. "The Techno-Economic Ecology of Corporate Strategy," Journal of Management Studies, February 1976.

Study of 79 firms correlating the perceived importance of each of several functional activities with the perceived magnitude of different forms of environmental competition. Corporate strategies of firms where managers perceived dynamic, undertain environments are likely to be significantly different from and more comprehensive than those of firms where managers perceive more static, predictable environments.

Ansoff, Igor H. "Managing Strategic Surprise by Response to Weak Signals," California Management Review, 18:2, 1975.

Discussion of the importance of anticipating and discovering threats and opportunities in an organizational environment early, when available information may yet be weak.

Tosi, H. and S. Carroll. "Management Reaction to Management by Objectives," Academy of Management Journal, 11, 1968.

They discuss some of the difficulties in using an objectives aproach to ensure commitment to an organization's purposes and plans.

Ernst, Martin L. "Stage Three for Computers: Management Decision Making," Illinois Businesss Review, 27, April 1970.

Strategy formation process requires understanding before use of the computer can be expanded in this area.

Vancil, R. F. "The Accuracy of Long-Range Planning," Harvard Business Review, September-October, 1970, and Formal Planning Systems, Harvard Business School, Cambridge, Mass., 1972.

Research on the structuring of strategy formation indicates that long-range forecast accuracy seems to be greater when a "bottom-up" approach is used than when a "top-down" approach is used.

Cyert, Richard M. and James G. March. A Behavioral Theory of the Firm, Prentice-Hall, Englewood Cliffs, New Jersey, 1963.

Builds upon the ideas first expressed by March and Simon in Organizations that organizations are coalitions of participants with different motivations and limited ability to simulataneously solve problems.

APPENDIX C

STATE OF MINNESOTA
DEPARTMENT OF ADMINISTRATION
SAINT PAUL 55155

OFFICE OF THE COMMISSIONER

TEL. NO. 296-8083

CHARTER FOR USER ADVISORY COUNCIL FOR INFORMATION SYSTEMS

Purpose

The User Advisory Council for Information Systems (UAC) exists to advise the Commissioner of Administration of all matters pertaining to the Commissioner's statutory responsibility for the "integration and operation of the State's computer facilities" (M.S. 16.90). The UAC serves as the primary point of exchange between the Commissioner of Administration - as the primary provider of data processing services - and the user community.

Scope

The importance of accurate and timely information for State decision making mandates a coordinated statewide approach. To this purpose the UAC will identify issues involving the management and the use of information processing resources. They will develop or cause to be developed policy statements that address these issues. The UAC will recommend policies for the management of the application development process and the operations process. The UAC will recommend policies for the resources required in development and operations: data, equipment, people and applications. The UAC will also assist the Commissioner of Administration in articulating user needs to the State Information Systems Advisory Council and the legislature. The Systems Advisory Council, also representing user agencies, is a technical resource reporting to the UAC. In all matters of policy, SAC will direct their concerns to the UAC and will receive from the UAC problems or issues for analysis and comment.

Membership

The Commissioner of Administration will select those departments and agencies who will be members of the UAC. The larger user agencies, as determined by their data processing budget, may have continuing membership on the UAC. Smaller agencies may be rotated on an annual basis. Typically, the membership will be made up of 10 large and 5 small user agencies.

AN EQUAL OPPORTUNITY EMPLOYER

Each agency head will select its representative for participation on the UAC. It is expected that the agency head will select someone at the Deputy/Assistant Commissioner or Director level. Attendance will be consistent from meeting to meeting. Substitutions, where necessary, should be at the same or higher level; reasons for substitutions should be given to the Agency Commissioner/Director and the Commissioner of Administration.

Organization

UAC shall elect a chairman and a vice chairman from its membership. UAC meetings shall be staffed by the Department of Administration. Council meetings shall be called by the chairman. The chairman is empowered to designate such committees and task forces as are necessary to resolve issues before the council. The committee and task force appointments are not necessarily limited to the UAC membership.

Amendments to the Charter

This Charter may be amended by a simple majority of those members present at the scheduled meeting. Notice of the proposed changes must be submitted in writing 30 days in advance of the scheduled meeting.

APPENDIX D

UNIVERSITY OF MINNESOTA
TWIN CITIES

Management Information Systems Research Center
College of Business Administration
93 Blegen Hall
269 19th Avenue South
Minneapolis, Minnesota 55455

May 7, 1979

Dear Manager/Director of State Information Processing:

The Management Information Systems Research Center (MISRC) of the University of Minnesota is working with the Department of Administration of the State of Minnesota to determine how the users of an information systems function may effectively guide the direction and operation of the State's Information Services Division (ISD). In Minnesota, the Information Service's Division of the Department of Administration is responsible for fulfilling the information processing needs of the various departments and agencies of State government.

A Users Advisory Council (UAC) comprised of Assistant Commissioner/Director level representatives of user departments exists to facilitate communication between users and the Department of Administration, and to recommend policies pertaining to: equipment, data, people, and applications resources; the systems development process, and the operations process.

To assist us in determining how UAC may effectively impact the policy formulation process of Minnesota's Information Services Division, we request that you complete and return this brief questionnaire. Any other relevant information would also be appreciated.

Sincerely,

J. David Naumann
Assistant Professor
Management Science Department

JDN:kr
Enclosure

INFORMATION SYSTEMS USER MANAGEMENT PARTICIPATION

Questionnaire
page 1

Name of state 29 complete responses

1. Does there exist a group of user/managers that interacts with the data processing department to direct growth, development and performance of the information processing activities in the state?

   Yes 21 No 8

   If you answered yes, please skip questions 2-5 and go to question 6.

   If you answered no, please answer questions 2-5 and skip the rest.

out of eight responses

2. Are policy makers knowledgeable about user agency goals, objectives, and activities?

   Yes 7 No 1

3. Are policy makers able to understand and communicate with technical people?

   Yes 4 No 4

4. Are policy makers experienced managers and administrators?

   Yes 7 No 1

5. Are policy makers knowledgeable about technical and economic factors relevant to the acquisition of equipment?

   Yes 3 No 5

6. What is the name of the group of user/managers?

   _____

out of 21 responses

7. Does the user/manager group participate in setting goals and objectives for planning and control of information systems processes and resources?

   Yes 19 No 2

8. Does the user/manager group select applications for development?

   Yes 8 No 13

9. Does the user/manager group develop guidelines to determine the location of equipment?

   Yes 4 No 17

INFORMATION SYSTEMS USER MANAGEMENT PARTICIPATION

Questionnaire
page 2

10. Does the user/manager group develop guidelines to aid in management of the data resource?

Yes 16 No 5

11. Does the user/manager group develop guidelines for the organizational location of systems development?

Yes 3 No 18

12. Does the user/manager group discuss and coordinate changes in individual user needs and priorities?

Yes 12 No 9

13. Does the user/manager group develop general guidelines for data control, security, privacy, and retention?

Yes 11 No 10

14. Does the user/manager group specify or prescribe methodologies to define, develop, and document all systems and their modifications?

Yes 10 No 11

15. Does the user/manager group monitor the performance of the applications development process?

Yes 6 No 15

16. Does the user/manager group monitor the performance of the operations process?

Yes 7 No 14

17. Is the user/manager group involved in developing guidelines to impose and enforce standards and controls?

Yes 11 No 10

18. Is the user/manager group involved in developing guidelines for the selection of processing equipment?

Yes 9 No 12

19. Does the user/manager group develop guidelines for training and career paths of data processing personnel?

Yes 12 No 9

20. Does the user/manager group meet

once a week	
once a month	11
irregularly	10

21. Does the user/manager group consist of

appointed commissioners	
agency heads	10
data processing heads	13

Thank you. Please return this questionnaire in the enclosed envelope to:

MISRC - UAC Project
93 Blegen Hall
269 19th Avenue South
University of Minnesota
Minneapolis, MN 55455

This questionnaire was completed by: Name _____

Organization _____

Mailing Address _____

_____

Phone Number _____