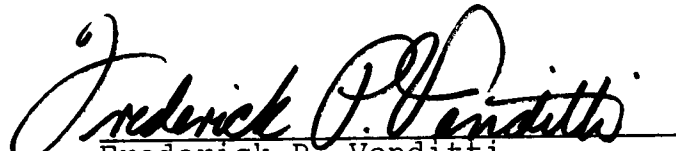
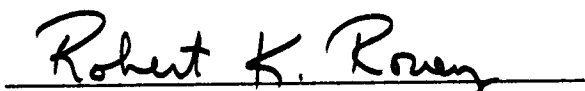


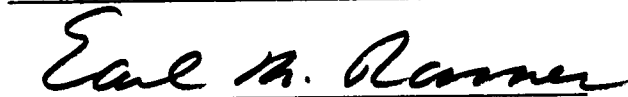
To the Graduate Council:

I am submitting herewith a dissertation written by Martha Lynn Porter entitled "Academic Planning Systems: The Selection and Analysis of Criteria for Departmental Staffing and Resource Allocation." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Educational Administration and Supervision.


Frederick P. Venditti
Major Professor

We have read this dissertation
and recommend its acceptance:



Accepted for the Council:


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p. 2

ACADEMIC PLANNING SYSTEMS: THE SELECTION AND
ANALYSIS OF CRITERIA FOR DEPARTMENTAL
STAFFING AND RESOURCE ALLOCATION

A Dissertation
Presented for the
Doctor of Education
Degree
The University of Tennessee, Knoxville

Martha Lynn Porter

March 1979

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ABSTRACT

The purpose of this study was to develop and implement a model procedure for the design of an institutionally-tailored planning system to assist in the allocation of faculty positions. The study involved three steps: first, a review of relevant literature to identify current practices and commonly used data elements; second, a verification of the data elements by institutions involved in planning activities; and third, an assessment of the data elements by departmental chairmen and other administrators at the selected institution, Memphis State University.

A four-point scale was used by the chairmen and other administrators to indicate the degree of usefulness of each of the identified data elements in staffing considerations. Analysis of the responses showed significant agreement among the total group of respondents on the rankings of the data elements. Three factors were tested for possible impact on the rankings. These were level of responsibility, college affiliation and departmental size. There was no significant difference shown in rankings by level of responsibility within the institution. Significant agreement was seen within three colleges, but not within two of the colleges examined. Departmental size was not a consistent determinant of significant agreement or disagreement.

A factor analysis of the responses was used as a guide in format design of a "Planning Profile" for staffing. Subjective responses directed attention to program factors and were a means of individualizing profiles for particular departments.

Inherent in this model procedure were the criteria of effectiveness cited in the literature: simplicity, flexibility and provision for participation of those who use the information in decision-making. Continuing development of the model might include regular reassessment of the data elements, the monitoring of possible areas of disagreement which would require further study, and analysis for format implications.

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CHAPTER I

THE PROBLEM AND ITS SIGNIFICANCE

Introduction

The development of planning and information systems in higher education was originally prompted by the rapid growth of enrollment and programs during the sixties. The thrust of early efforts was to organize a proliferation of data into an order that academic administrators could better use in evaluating the needs for facilities, programs and faculty. Examples of these efforts included a plan by the Department of Health, Education and Welfare in the form of the Higher Education General Information Survey (HEGIS) and a Management Information System by the Western Interstate Commission for Higher Education (WICHE). Both of these efforts focused on standardized data elements for use in comprehensive planning systems, data exchanges and statistical profiles.

The literature suggests that planning and information needs have changed somewhat since the sixties as "the problem of dealing with growth has become the problem of adjusting to the steady state."¹ Emphasis on planning during the

¹Carl R. Adams, ed., Appraising Information Needs of Decision Makers, No. 15, New Directions for Institutional Research (San Francisco: Jossey-Bass, Inc., 1977), p. 61.

seventies comes from concern over the steady, and sometimes declining, state of enrollments that exists in higher education. Also promoting an interest in planning are pressures for accountability in the allocation and use of resources from the federal, state and local levels.

As a result of the new and more urgent emphases of a steady state and accountability demands, administrators are reviewing currently available systems in a search for planning assistance. However, the assistance has been limited, and the literature reflects a critical response from many administrators. Weaknesses cited include the size and rigidity of data requirements, inflexible report-writing programs, lack of timeliness, and excessive cost. In addition to these structural limitations, administrators also cite an apparent disregard among system developers for the intuitive and political nature of planning and decision-making in the educational process.² "There seems to exist some sort of no man's land between the operational use of a model in a decision-making environment and the theoretical development of the model. . . ."³

²Richard C. Richardson, Don E. Gardiner and Ann Pierce, "The Need for Institutional Planning," College and University Bulletin, XXX, No. 1 (September, 1977), p. 3.

³Charles B. Johnson and William G. Katzenmeyer, eds., Management Information Systems in Higher Education: The State of the Art, (Durham: Duke University Press, 1969), p. 133.

To overcome these identified weaknesses and "bridge the gap" between development and use, it has been recommended that planning systems be tailored to individual institutions.⁴ Current authorities also have suggested that the total or comprehensive information system, which attempts to integrate all planning needs into one program, is not "a serviceable concept . . . ,"⁵ for if "information systems are to serve as a foundation for educational judgment, they must be accommodated to the limits of human intuition."⁶ To be effective, planning procedures must "be characterized by simplicity, flexibility, . . . and provision for meaningful participation by all concerned."⁷

Statement of the Problem

The basic problem which prompted this study was the absence of planning systems for the allocation of faculty positions which met the criteria of effectiveness noted in the literature ("simplicity, flexibility, . . . and provision for meaningful participation . . . "⁸) and which, by the nature of their content and design, encouraged the use of planning and management techniques by academic administrators.

⁴Adams, p. 83.

⁵Adams, p. 26.

⁶Adams, p. 27.

⁷Richardson, p. 3.

⁸Richardson, p. 3.

Purposes of the Study

An initial purpose of the study was to review current planning practices in higher education and through this review to identify data elements commonly employed in planning systems and tools which related to academic staffing.

Building upon this review, the primary purpose of the study was to develop and implement a model procedure for the design of an institutionally-tailored planning system to assist in the allocation of faculty positions. The focus of the procedure was to incorporate the criteria of effectiveness cited in the literature, developing a system which was both simple and flexible and which provided for the final selection of a major part of the data elements by those who are responsible for the decisions concerning staff and resource allocation and management.⁹

Importance of the Study

The emphasis on planning in higher education is a recent phenomenon,¹⁰ and has resulted in the rapid development of numerous and sometimes complex planning systems or models for use in many facets of university planning. Resources

⁹ John G. Bolin, ed., Management Information for College Administrators, (Athens: University of Georgia, Institute of Higher Education, 1971), p. 9.

¹⁰ Richardson, p. 3.

which offer syntheses and overviews of developments, applications, evaluations and trends are scarce. The initial phase of this study sought to provide such a resource through a survey of the literature on planning and correspondence with institutional planners. Included were the varying perspectives on planning, the analytical tools designed to assist in planning, and suggested research directions.

The second phase of this study outlined a model procedure for the development of a planning system to assist in the allocation of faculty positions to the academic departments. The design of the procedure seeks to answer the two most frequently voiced criticisms of current planning systems. The literature consistently reflected concerns that there is a lack of recognition of the decision-making procedures which are unique to the university setting and only minimal involvement of decision-makers in the development of systems. The presence of these two limitations often results in the rejection of planning tools which could prove helpful to the academic administrator. This model for the development of a "Planning Profile" to assist in staffing decisions includes requirements for a participatory procedure designed to encourage acceptance and utilization of pertinent data in a continuing planning process.

Assumptions

1. There exists an identifiable set of common data elements in use in current planning systems which relate to academic staffing.

2. Historical and descriptive quantitative data can serve a useful purpose in educational decision-making.

3. A planning system constructed for and tailored to the needs of an individual institution with the participation of the users will have better acceptance and utilization than would a standardized system or a system constructed by technicians.

4. The opportunity for users to select data elements and influence the format of the planning system will serve as one means of recognizing the political aspect of decision-making in the university setting.

Limitations and Delimitations

This study was necessarily limited by the degree of interest and cooperation of those surveyed in the identification and assessment of data elements for use in the planning system. Final design and implementation of the system were also limited by necessary accommodations to local institutional practice and decisions. The following delimitations were additionally applied:

1. Common data elements were sought only from planning systems which related specifically to staffing in the academic department and which had been in use for at least three years in a university or college with a student headcount enrollment of 10,000 or greater; and

2. The model was implemented through reactions to and assessments of the data elements from department chairmen, academic deans, and selected administrators at Memphis State University.

Definitions of Terms

This study included certain terms unique to the subject under consideration. For purposes of this study, these terms were identified as follows:

Academic Administrator - a line or staff officer of an educational institution who is directly or indirectly involved with the management and allocation of human and fiscal resources for the operation of academic programs;

Academic Department - an organizational unit within the educational institution which is the source of academic instruction, service and research; may be centered on one academic discipline or a set of related disciplines;

Flexibility - a planning system descriptor which indicates a potential for revisions in format and report procedures with minimal expense and expenditure of time;

Information System - a comprehensive data storage and recall system that is used for day-to-day management as well as planning and compliance with data requests from external sources;

Planning Profile - a collection of data elements selected by the academic users which relates to the academic department and is prepared in a format appropriate for use as an aid in resource and staff allocation decisions;

Planning System - a system of data analysis, usually computer-based, which results in projections of needs and/or resources; may include a variety of related data, or be limited to one area, such as credit hour production;

Resource Allocation - the assignment of funds for the support of academic staff, graduate assistants and part-time faculty;

Simplicity - a planning system descriptor that indicates the system can be utilized with minimum orientation for the academic user in widely varying disciplines (chemistry, music, accountancy, etc.);

Staff Allocation - the assignment of full-time and part-time faculty positions and graduate assistants to the academic department.

Questions

In the development procedure for the Planning Profile the following questions were addressed.

1. What are the data elements most commonly used in planning systems which relate to academic staffing in colleges and universities of a select size?

2. In the assessment of the identified data elements for their degree of usefulness in staffing considerations, is there significant agreement:

- a. among the total group of chairmen, deans and other administrators
- b. among the groups based on level of responsibility:
 - (1) among chairmen,
 - (2) among deans and other administrators, and
 - (3) between chairmen and deans and other administrators;
- c. among the groups based on college affiliation:
 - (1) within groups of chairman based on college affiliation, and
 - (2) among groups of chairmen based on college affiliation;
- d. among groups based on departmental size:
 - (1) within groups of chairmen from departments of varying sizes; and
 - (2) among groups of chairmen from departments of varying sizes.

3. Will any common concerns for additional data elements or data interpretation be expressed in comments from the chairmen, deans and other administrators?

4. From the responses, what relationships (factor groupings) among data elements can be identified?

Procedures

The initial phase of this study was a review of the literature on planning in higher education, with attention given to both the potential and limitations of the planning process and the analytical tools which have been developed to assist in planning. The review of literature served also as a source of data elements commonly used in planning systems related to staffing in the academic departments as well as a list of institutions of higher education involved in the development and application of planning techniques.

Institutions which, from descriptions in the literature, were involved in planning activities were asked to review the list of data elements identified from the literature. The selection of institutions and analysis of responses were subject to the stated delimitations of a minimum headcount enrollment of 10,000 and a planning system for staffing which had been in use at least three years.

Responses from institutions which met the stated criteria were summarized and the data elements identified

which were in use by at least half of the institutions. These data elements were the basis for the design of a survey instrument used in collecting reactions from the defined survey group at Memphis State University.

The survey instrument gave the respondents the opportunity to rank the data elements on a four point scale which reflected the degree of usefulness of the elements in staffing considerations. Descriptors were as follows:

- 1 - Unnecessary
- 2 - Perhaps useful, but of questionable value
- 3 - Desirable, would use if available
- 4 - Highly desirable, an essential characteristic.¹¹

Additionally, opportunity was given for the respondents to suggest new elements for inclusion in the planning process.

Analysis of the data from this survey was structured to relate specifically to the questions posed. The Kendall coefficient of concordance was used to test for agreement within the total group and the various defined subgroups. The Kolmogorov-Smirnov one-sample test was used to examine the patterns of responses from the total group on each individual data element. In cases which involved the comparison of median rankings from two groups, the Mann-Whitney U test was employed. Significance of test results

¹¹ Joseph Patrick and Joseph Harold, "MIS Revisited," Journal of Educational Data Processing, XIII, 13 (1976), p. 20.

was checked at the .05 level for the Kolmogorov-Smirnov test and at the .01 level for all other tests.

Data elements which were not included in the reaction list but were suggested by survey respondents were evaluated on the basis of (1) frequency of inclusion; (2) accessibility of requested information; and (3) relationship of suggested data elements to unique departmental programs. Assessment of these items was subjective. In the final analysis, responses were treated as a means for individualizing those departmental profiles from which responses came and as a potential source for additional staffing considerations for all departments.

A factor analysis of the responses from the total group provided guidance in the design of a format for the final Planning Profile. The Profile included data elements from the survey which, on the basis of the Kolmogorov-Smirnov test, showed significant patterns of high rankings.

Organization of the Study

Chapter I includes the rationale and importance of the study and an outline of procedures.

Chapter II provides additional background for the study through a review of the literature on the planning process in higher education and the analytical tools which have been developed to support planning efforts.

Chapter III includes the presentation of the data and results from the analyses of the survey at Memphis State University.

Chapter IV summarizes the procedures and findings of the study and presents implications for the utilization and further development of a planning system to assist in the allocation of faculty positions.

CHAPTER II

REVIEW OF THE LITERATURE

The literature and research relative to planning activities in colleges and universities reflect a variety of approaches to a complex process. Two basic perspectives emerge which often result in contrary evaluations and recommendations. One perspective is that of the administrator responsible for formulating and implementing the plans and goals of the university; the other is that of the researcher and developer of the various planning tools and techniques. Those with the latter perspective are likely to reflect the feeling that planning should be done in "a systematic and coherent way. . . ." ¹ They see great potential for the planning tools and techniques being developed. Administrators with the former perspective view planning more as an art which may be hindered rather than enhanced by the array of information generated from these planning tools.

Both of these perspectives are apparent in each of the four broad categories of this review of literature. These categories include: (1) previous and current roles for planning; (2) obstacles to planning; (3) the requirements

¹Juan A. Casasco, Planning Techniques for University Management (Washington: American Council on Education, 1970), p. 3.

and applications of available planning tools; and (4) the recommendations and trends that are seen in the research and development of planning in higher education.

Previous and Current Roles for Planning

Historically, planning in universities and colleges is characterized as a rather informal process concerned mainly with expected growth.²

During much of the 1960's funds came relatively easy in both the public and private sectors of higher education. There was little concrete long-range planning, except of a rather superficial nature. Few really looked down the road to see what lay ahead.³

During this period, ". . . expanding enrollments and steadily increased support to higher education made expedient planning a reasonably satisfactory response to environmental pressures."⁴

The current "emphasis on broad-based institutional planning is largely a phenomenon of the seventies,"⁵ stimulated by "stabilizing or declining enrollments, . . . an

²Raymond N. Kieft, Academic Planning: Four Institutional Case Studies (Boulder: NCHEMS, 1978), p. 1.

³Peggy Heim, "The Use and Misuse of Management Information: Advantages and Disadvantages from the Perspective of the Institution," Information Impact: Collision with Tradition, Proceedings of the Second National Forum on New Planning and Management Practices in Postsecondary Education, ed. Richard R. Millard (Chicago, 1973), p. 21.

⁴Richardson, p. 3.

⁵Richardson, p. 3.

inflationary economy, and increased competition for financial resources. . . ."6

The era of declining resources into which many colleges have now moved furnishes both the incentive and the necessity for developing . . . strategic institutional planning. . . .7

Despite these pressures, ". . . the state of the art of planning is not far advanced."8 With rare exceptions, efficient and effective methods of planning for resource allocation have not been implemented.9

The allocation of resources has become the most pressing problem in institutional management,10 and will continue to force systems and institutions of higher education to "undertake realistic planning that has been urged in the past."11 The object of planning has become the allocation

⁶Eugene C. Craven, "Information Decision Systems in Higher Education: A Conceptual Framework," Journal of Higher Education, XLVI, No. 2 (1975), 126.

⁷Richardson, p. 3.

⁸Richardson, p. 3.

⁹Paul Dressel and Lou Anna Kimsey Simon, eds., Allocating Resources Among Departments, New Directions for Institutional Research, No. 11 (San Francisco: Jossey-Bass, Inc., 1976), p. 1.

¹⁰Heim, p. 3.

¹¹Frank M. Bowen and Lyman A. Glenny, State Budgeting for Higher Education: State Fiscal Stringency and Public Higher Education (Berkeley: University of California, Berkeley, Center for Research and Development in Higher Education, 1976), p. 63.

of scarce resources among competing activities.¹² Today the concern is "less with the budgetary consequences of educational decisions than with the educational consequences of budgetary constraint."¹³

With this impetus, attention is increasingly directed to the application of management science and analytic tools as aids in the planning process. ". . . Most college administrators want to make use of management science techniques to assist them . . . , [but are hindered by] a lack of understanding of what is available."¹⁴ They "must have access to information which shows . . . consequences of alternative actions"¹⁵ and "a more systematic approach to planning than is evident on most college and university campuses today."¹⁶

¹²Paul W. Hamelman, ed., Managing the University: A Systems Approach (New York: Praeger Publishers, 1972), p. 47.

¹³Stephen Hoenack and others, "University Planning, Decentralization and Resource Allocation," Socio-Economic Planning Sciences, VIII, No. 5 (1974), 257.

¹⁴Roger G. Schroeder and Carl R. Adams, "The Effective Use of Management Science in University Administration," Review of Educational Research, XLVI (1976), 117.

¹⁵Hoenack, p. 257.

¹⁶William H. Berquist and William A. Shoemaker, eds., A Comprehensive Approach to Institutional Development, New Directions for Higher Education, No. 15 (San Francisco: Jossey-Bass, Inc., 1976), p. 1.

Obstacles to Planning

The planning process, and the tools and techniques which support it, face a variety of obstacles within the university or college organization.

Some observers have argued that planning . . . will not meet with success because of the constraints imposed by the distinctive nature of the higher education enterprise. Planning frameworks or models are designed to channel future resources and activities into paths that will be productive in the attainment of specific goals and objectives. Unfortunately, institutional goals and objectives in higher education are characterized by researchers as being ill-defined, vague, ambiguous or nonexistent.¹⁷

Potential hindrances are also seen in gaining general acceptance on a campus for planning and the accompanying techniques.

. . . If the procedure through which a planning system is implemented violates the principles of participation on which the system is based, the consequence can only be rejection and informal resistance among those affected.¹⁸

Experience indicates "the inadvisability of having a system being perceived as 'imposed' upon a college."¹⁹ Information on assumptions, procedures and data must be shared widely and freely.²⁰

¹⁷Richardson, p. 4.

¹⁸Richardson, p. 5.

¹⁹Kevin M. Diran, "Management Information Systems: The Human Factor," Journal of Higher Education, XLIX, No. 3 (1978), 278.

²⁰Kent G. Alm, Elwood B. Ehrle and Bill R. Webster, "Managing Faculty Reductions," Journal of Higher Education, XLVIII, No. 2 (1977), 158.

A particular point of resistance and misunderstanding lies in the analytic tools being developed to aid in the planning process. One objection is that "college and university administrators often become bogged down in 'techniques and tools' of planning systems, thereby losing sight of the real problems and goals."²¹ A survey of small colleges concluded that "complex planning processes are unwanted and inappropriate for institutional management. . . ."²² This objection was more simply stated by the president of a large university: "What does one do with mountains of computer printouts? . . ."²³

Other objections relate to the inflexibility and cost of these tools. "Issues and questions raised by university decision-makers change and limit the utility of many computerized report generators. . . ."²⁴ The cost, in both dollars and time, is seen as a limiting factor.

²¹Harold Enarson, "The Art of Planning," Educational Record, LVI (Summer, 1975), 170.

²²Carl R. Adams, Theodore E. Kellogg and Roger G. Schroeder, "Decision-Making and Information Systems in Colleges: An Exploratory Study," Journal of Higher Education, XLVII (January/February, 1976), 45.

²³Enarson, p. 172.

²⁴Joseph L. Gubasta and Norman Kaufman, "Developing Information for Academic Management: An Alternative to Computer-Based Systems," Journal of Higher Education, XLVIII, No. 4 (1977), 405.

It does little good to develop a new tool that is

appreciated by academic administrators but is too costly in terms of managerial resources to justify its use. This seems particularly true for techniques dealing with planning, which a busy administrator can easily defer.²⁵

In a period of limited resources, diverting funds and staff effort to "complex planning models may be difficult to justify."²⁶

A systematic planning process with wide participation and sharing of information may have other drawbacks to the college administrator.

A traditional source of power in the senior administration has been a monopoly on information in crucial areas, . . . and a near-monopoly on the ability to correlate and coordinate information from a variety of external and internal sources.²⁷

"Control of information is power,"²⁸ and the planning process may contain the threat of diluting or shifting that power.

Critics also question whether a process which emphasizes a systematic and rational approach to decision-making is

²⁵ Adams, "Decision-Making and Information," p. 46.

²⁶ Richardson, p. 3.

²⁷ Frederick E. Balderston, "The Design and Uses of Information Systems," Evaluating Institutions for Accountability, New Directions for Institutional Research, No. 1 (San Francisco: Jossey-Bass, Inc., 1974), p. 55.

²⁸ M. D. Scherer and others, "Management Information Systems: Changing Institutional Behavior," College and University, LI (Summer, 1976), 675.

suited to an environment where decisions often have an intuitive or political base.²⁹

. . . More than a decade of study of the actual decision-making process of the public sector in general, and of colleges and universities in particular, shows that rationality would be, at best, a very loose characterization of the decision-making process of these activities.³⁰

Deans and vice-presidents, department chairmen, trustees, chancellors and provosts live in an environment that is highly unstructured and very rich in nonquantitative values.³¹

According to one administrator, knowing the cost of instruction does not help in the decision to phase out a foreign language program or cut the library budget.³²

In the fifteen years that I have served as an academic administrator, I have stared helplessly at more reports than I dare remember. But I can recall few reports that contributed directly or even indirectly to what is pompously called the "decision-making process."³³

In addition to the volume of data produced by these planning tools and techniques, they are often highly

²⁹Richardson, p. 5.

³⁰George Weathersby, "The Potentials of Analytical Approaches to Educational Planning and Decision Making," Information and Analysis in the Context of Institutional-State Relationships: The Tie that Divides Us, Proceedings of the 1976 National Assembly of the National Center for Higher Education Management Systems, ed. William Johnston (Boulder: NCHEMS/WICHE, 1976), p. 98.

³¹Charles J. Mosman, Academic Computers in Service (San Francisco, Jossey-Bass, Inc., 1973), p. 127.

³²Enarson, p. 172.

³³Enarson, p. 173.

theoretical and difficult to grasp for administrators not quantitatively oriented.³⁴ A recurrent complaint is that reports are "prepared simply because the computer was able to perform the feat and not because the administrator really needed the information."³⁵

Despite the numerous limitations and questions surrounding the planning process and its accompanying tools and techniques, the necessity for planning cannot be denied. Success of even a small measure demands a realistic approach.

In the past many people have been disappointed with planning because they expected too much and frequently expected the wrong things. Planning will not provide a perfect crystal ball nor predict the future with accuracy nor prevent mistakes, but a systematic planning process will minimize the degree to which one is taken by surprise. . . . Planning should not be judged solely by whether it hits the original target, but by whether it helps to accomplish the best possible results in a changing environment.³⁶

The type of creative and planned change so essential to the next decade "can happen only if the more complex quantitative techniques and technologically sophisticated models remain our servants rather than our masters."³⁷

³⁴Casasco, p. 75.

³⁵Francis E. Rourke and Glenn E. Brooks, The Managerial Revolution in Higher Education (Maryland: The Johns Hopkins Press, 1966), p. 29.

³⁶E. J. Green and P. C. Winstead, "Systematic Institutional Planning," Educational Technology, XV (July, 1975), 33.

³⁷Richardson, p. 6.

The Planning Tools

Definitions, Positions and Considerations

The total planning process involves "an interrelated collection of information, decision procedures, and people who direct the operation of an organization."³⁸ The tools which are employed to assist in this process relate most directly to the collection of information but the other two factors, the decision procedures and the people, have a significant impact on the design and use or misuse of these tools. The basic function of the various tools is to take raw data and aggregate, transform, interpret and appropriately convey it in such a manner that it can serve as information for a decision.³⁹ The chief motivation in the development of these tools has been "an effort to bring rationality to a casual system of decision-making. . . ."⁴⁰ Thus begins the debate.

The basic contention of those who advocate the use of quantitative analytic tools or models to support planning is that the important variables affecting the future of the institution can be expressed numerically, and related mathematically in ways that approximate reality. Critics respond

³⁸Roger G. Schroeder, "Management Systems Design: A Critical Appraisal," New Directions for Institutional Research, No. 13 (Spring, 1977), p. 99.

³⁹Frederick E. Balderston, Managing Today's University (San Francisco: Jossey-Bass, Inc., 1974), p. 231.

⁴⁰Heim, p. 22.

that the most important factors determining future directions are so imprecise or so often politically derived that a quantitative model will never be adequate enough to deserve any degree of confidence. Worse, a quantitative model may produce results that imply a degree of knowledge and understanding that does not exist.⁴¹

The compromise position is that planning tools "must tolerate the imprecision characterizing real life situations and produce results that are clearly identified as . . . estimates or rough approximations."⁴²

. . . The quantitative approach can be viewed as a resource—a set of possibilities—rather than a direct answer or solution to any of the problems and opportunities confronting higher education today.⁴³

In the debate over tools and techniques, it should be noted that the "accuracy, reliability, timeliness, and utility of the data . . . take precedence over the actual system used. . . ."⁴⁴

Key factors in the successful use of these tools are careful design and teamwork. ". . . The decisions as to what information is appropriate, in what form, for whom, and with what frequency are . . . critical . . . ,"⁴⁵ and "demand teamwork on the part of all personnel in the

⁴¹Richardson, p. 4.

⁴²Richardson, p. 4.

⁴³G. Ben Lawrence and Allan L. Service, eds., Quantitative Approaches to Higher Education Management: Potential, Limits and Challenge (Washington: American Association for Higher Education, 1977), p. 10.

⁴⁴Gubasta, p. 403.

⁴⁵Hamelman, p. 36.

institution. . . ."46 The design must consider the previously mentioned factor of decision procedures.

". . . Information must be integrated with decision-making processes in order to be useful."47

Individual perceptions of the kind of information that is required to meet a decision-making setting may vary. Thus, the personal decision-making style of each decision-maker whom the system is to serve must be considered since it may bear definite implications for the content and mode, as well as the format, of information communication and utilization. . . .48

One reason that "university planning models proposed in the past few years have not been found useful in practice is that they [have taken] inadequate account of the . . . nature of decision-making within universities."49

Careful design and teamwork are also necessary to avoid the resistance that may emerge as more emphasis is placed "on the use of valid information and technical competence, rather than formal power, to manage organizations."50 Sophisticated planning tools that "introduce into organizations a quantum jump in rationality represent a stressful

⁴⁶Bolin, p. 18.

⁴⁷Schroeder, "Management Systems Design," p. 103.

⁴⁸Craven, p. 129.

⁴⁹Hoenack, p. 257.

⁵⁰Chris Argyris, "Management Information Systems: The Challenge to Rationality and Emotionality," Management Science, XVI, No. 6 (February, 1971), p. B278.

and emotional problem to the participants."⁵¹ Thus, vital factors are involvement of the people who direct the organization, and a design which can give each person "the kind of information he is psychologically attuned to and will use most effectively."⁵²

The "Prepackaged" Models and Systems

The development of analytical tools, models and systems has become a business, both profit and nonprofit. The prepackaged approach offers computer programs, test data, documentation, and assistance in implementation, either through consultants or seminars. In describing their products the promotional literature uses such phrases as "meet the needs of a wide range of institutions without being overly simplified,"⁵³ and

sufficiently flexible and broad in scope to encompass the characteristics and planning information needs of institutions ranging from a two-year college . . . to a university with . . . enrollment in the thousands.⁵⁴

⁵¹Argyris, p. B281.

⁵²Richard O. Mason and Ian I. Mitroff, "A Program for Research on Management Information Systems," Management Science, XIX, No. 5 (January, 1973), p. 478.

⁵³John Minter and Charles Thomas, eds., "RRPM-1 Model Gives Hard Answers to 'What If?'," Higher Education Management, I, No. 2 (1971), 1.

⁵⁴Casasco, p. 21.

The objectives of the models and systems are "to improve the efficiency of resource allocation and raise the quality of planning."⁵⁵

The models most frequently mentioned which appear to be in use to some extent have similar functions.

Most . . . are characterized by a logic that translates a set of student enrollment projections into a set of projected workloads and then applies policy or historical parameters to project resource implications of the student enrollments used as input. Major differences among the available models are chiefly in areas such as level of detail or aggregation, amount of data required, size of the model, and cost of implementation.⁵⁶

The predominant developer is the National Center for Higher Education Management Systems (NCHEMS), formerly a division of the Western Interstate Commission for Higher Education (WICHE). This is a nonprofit organization, with materials and programs available at the cost of reproduction. The project was initiated in 1968

by representatives of several western universities who saw a need to cooperate in designing and using information gathering tools. . . . The early idea has . . . spread to include all types of institutions, . . . engaging the attention and backing not only of state agencies but of the federal establishment, which now provides most of the funds for NCHEMS.⁵⁷

⁵⁵Casasco, p. 17.

⁵⁶Lawrence, p. 58.

⁵⁷Balderston, "Design and Uses of Information Systems," p. 52.

. . . The WICHE . . . program consists of the development of analytical models pertaining to resource allocation and the identification and definition of the data elements necessary to operate the models.⁵⁸

The identification and definition of the data elements have been a major effort but has received mixed reviews. The data element dictionary "defines terms in the areas of students, staff, courses, finance and facilities"⁵⁹ for use in the NCHEMS analytical models. In the view of some, "the idea of common data definitions is a good one and should be adopted, to the extent that it is practical, in individual institutions."⁶⁰ From another viewpoint, "one serious NCHEMS mistake has been the assumption that a single set of data elements exists for higher education."⁶¹

. . . Although there is substantial commonality between the types of quantitative data used, differences in their origin and the ways they are combined are substantial. It is, therefore, no surprise that the efforts at NCHEMS at standardization of data and process in higher education are failing.⁶²

The success of the efforts at NCHEMS are difficult to judge. Since their materials are available at nominal cost,

⁵⁸Johnson, p. 112.

⁵⁹Schroeder and Adams, p. 120.

⁶⁰Schroeder and Adams, p. 120.

⁶¹Joe B. Wyatt and Sally Zeckhauser, "University Executives and Management Information: A Tenuous Relationship," Educational Record, LVI (Summer, 1975), p. 187.

⁶²Wyatt, p. 184.

many institutions have access to their programs. However, "several attempts by NCHEMS to provide some information regarding the impact of its efforts have been inconclusive."⁶³ Implementation of the systems demands considerable technical capabilities and coordination, and "only a relative handful of the nation's nearly twenty-five hundred colleges and universities are capable of standardizing the required data. . . ."⁶⁴

Other questions are raised by the scope and sources of support for NCHEMS.

The efforts at NCHEMS are alarming because they are supported by large amounts of federal funds which overwhelm individual efforts at the institutional level, especially small institutions.⁶⁵

The parent organization, WICHE, has received over forty-six million dollars in grant and contract support since 1954. The NCHEMS division, which became independent in the summer of 1977, has received over seventeen and one-half million dollars of funding in the last ten years. It continues to receive substantial funding (a basic contract of 1.5 million dollars) from the National Institute of Education.⁶⁶

⁶³ Adams, "Appraising Information Needs," p. 63.

⁶⁴ Gubasta, p. 402.

⁶⁵ Balderston, "Design and Uses of Information Systems," p. 52.

⁶⁶ Statement from Communications Department, Western Interstate Commission for Higher Education, Boulder, Colorado, January 10, 1979; Annual Report 1975-WICHE

NCHEMS appears to be responding to some of the criticisms in the literature. In 1974, the charge was made that the primary focus at NCHEMS was "on management systems and not on the nuances of teaching, research and the academic styles of colleges and universities."⁶⁷ In one of its most recent publications, A Handbook for Institutional Academic and Program Planning, the following statements are included in the epilogue:

The importance of the participation of faculty and their representatives in planning is threefold. First, the primary elements of an institution's plans are academic; the academicians are among the most qualified to advise in developing such plans. Second, their conditions of work are most affected by these plans; therefore, they are entitled to participate. And third, a plan's effectiveness ultimately depends on its implementation; as the parties who put the academic plan into practice, faculty are crucial to its adoption and success.

.
Plans are only as good as the people who prepare them. . . . Even ideal plans require substantial support or consensus among constituencies. And it goes without saying that plans may be defeated in their implementation. So in urging planning upon our colleagues, we must be careful not to overpromise.⁶⁸

(Boulder: WICHE, 1976), p. 18; NCHEMS (Boulder: National Center for Higher Education Management Systems, 1978), brochure; Gordon Ziemer, "Action Report: Fiscal Affairs and Operations Committee," NCHEMS July 1978 Board Agenda (mimeographed).

⁶⁷ Balderston, "Design and Uses of Information Systems," p. 52.

⁶⁸ Raymond N. Kieft, Frank Armijo and Neil S. Bucklew, A Handbook for Institutional Academic and Program Planning: From Idea to Implementation (Boulder: NCHEMS, 1978), p. 61.

The other major system which is available was developed at the University of Toronto. Beginning in 1964, through a study for the Commission on the Finance of Higher Education in Canada, Richard Judy and Jack Levine constructed CAMPUS (Comprehensive Analytical Models for Planning in University Systems).

CAMPUS is a system of simulation models and related information systems and budgeting techniques designed to help university and college planners understand more clearly the cost implications of their various ideas about the possible future of their schools.⁶⁹

The program

accepts inputs describing the structure of the college, academic programs and policies, enrollment, staff, facilities, and space. On these bases, it projects student flow, faculty load and teaching space, and the impact on support resources (such as the library). Finally, forecasts of costs and revenues are made.⁷⁰

The initial implementation at the University of Toronto was not really successful. "Problems encountered ranged from political and organizational . . . to technical ones concerning the design of the simulation systems and the available computer facilities."⁷¹ The programs were revised through a grant from the Ford Foundation and the data processing package was made compatible with WICHE data

⁶⁹George Mowbray and Jack B. Levine, "The Development and Implementation of CAMPUS: A Computer-Based Planning and Budgeting System for Universities and Colleges," Educational Technology, XI (May, 1971), p. 28.

⁷⁰Mosmann, p. 132.

⁷¹Mowbray, p. 28.

formats.⁷² The CAMPUS system has been adapted by several schools, including the University of Colorado⁷³ and the University of Minnesota.⁷⁴ It is available to smaller schools through time-sharing services "by means of remote terminals from the user institution to a central utility."⁷⁵

The programs are marketed by Systems Dimensions Limited of Toronto, Canada. They are

by far the most comprehensive, sophisticated and expensive of all models. The cost of using CAMPUS includes the cost of acquiring the software and hiring consultants to show the user how to run and use the model. CAMPUS also demands the most input data and the greatest skill at running and using the model. . . .⁷⁶

These factors may explain why some CAMPUS users have changed to NCHEMS products, including Colorado's statewide implementation program.⁷⁷

Other proprietary models include HEPS (Higher Education Planning System), marketed by Education and Economic Systems, Inc.; HELP/PLANTRAN (Higher Education Long-Range Planning/Planning Translator), marketed by the Midwest Research Institute; and SEARCH (System for Exploring

⁷²Mowbray, p. 28.

⁷³Thomas R. Mason, ed., Assessing Computer-Based Systems Models, New Directions for Institutional Research, No. 9 (San Francisco: Jossey-Bass, Inc., 1976), p. 88.

⁷⁴Hamelman, p. 2.

⁷⁵Mowbray, p. 28.

⁷⁶T. R. Mason, p. 100.

⁷⁷T. R. Mason, p. 100.

Alternative Resource Commitments in Higher Education), a development of Peat, Marwick and Mitchell.

As noted previously, the models have similar functions, despite some differences in approach and development. They also

share some limitations from the point of view of the user: the output is a mass of numbers with no graphic representations to visualize trends; . . . no help is provided in arriving at stable input data . . . ; and finally, there are no searching techniques incorporated in the models to help converge on solutions that are more economically rational and, at the same time, politically feasible.⁷⁸

"To date, vendor-supplied systems have had a relatively small impact on planning, management and evaluation."⁷⁹ As well as the technical limitations mentioned above, ". . . the system installation process rarely includes an effort to improve the decision process itself."⁸⁰ After the system is installed, decision making continues as usual.⁸¹

The great diversity in college administration has made it difficult to develop and implement standardized or prepackaged systems. Experience and research have indicated that a more flexible approach, with systems tailored to

⁷⁸T. R. Mason, p. 100.

⁷⁹Schroeder, "Management Systems Design," p. 106.

⁸⁰Schroeder, "Management Systems Design," p. 107.

⁸¹Schroeder, "Management Systems Design," p. 107.

individual institutions, may result in a better implementation record.⁸²

Management Information Systems

There is no universally accepted definition of a management information system, but there is agreement on the general properties and functions. Under the broadest definition, a management information system is

any method that provides the right decision-maker with the right information in the right form at the right time . . . to facilitate the decision-making process. . . .⁸³

More specifically,

a management information system (MIS) generally refers to collection, storage and retrieval of information for both planning and control functions. The information in a MIS will usually include financial and budgeting information as well as other information such as student records, enrollment data, course demand data, facility planning data, and so on.⁸⁴

Commercially developed "packaged" systems are available. However, they are subject to the same criticisms noted in the previous section. ". . . Few, if any, are likely to

⁸²Adams, "Appraising Information Needs," p. 83; Adams, "Decision-Making and Information Systems," p. 47; Hoenack, p. 257.

⁸³Craven, p. 127.

⁸⁴Roger G. Schroeder, "A Survey of Management Science in University Operations," Management Science, XIX (April, 1973), p. 897.

meet the needs of a given institution because of the variety"⁸⁵ of requirements among institutions.

System design, which is extremely important, is also very difficult. The current state of MIS development is typically poor.⁸⁶

Most organizations have not conceived and planned their MIS with any significant amount of attention given to its intended function—providing information for decision-making. Most MIS's traditionally have not been designed at all; they have evolved as a byproduct of the process of automating or improving existing systems within an organization.⁸⁷

Whether systems "evolve" or receive careful development, a crucial element in the design process is often neglected. This element is the participation of those who are to use the system. A Harvard study concluded that university administrators were often "isolated from the design and development of systems that, in theory, were constructed to meet their needs."⁸⁸ No management information system should ever be activated unless the administrators who are to use its products understand the system well enough to evaluate and control it.⁸⁹

⁸⁵Gail S. Hines, "Why University Management Information Systems Have Failed," Journal of Educational Data Processing, XIV, No. 3 (1977), p. 5.

⁸⁶Schroeder and Adams, p. 120.

⁸⁷Hines, p. 2.

⁸⁸Wyatt, p. 182.

⁸⁹Russell L. Ackhoff, "Management Misinformation," Management Science, XIV, No. 4 (1967), p. B153.

Another design consideration concerns the amount of data produced. The reactions to "mountains of computer printouts"⁹⁰ are almost uniformly negative. "The consequences of changing the emphasis of a MIS from supplying relevant information to eliminating irrelevant information is considerable."⁹¹ If the information problem is seen, primarily, but not exclusively, as one that comes from an overabundance of irrelevant information, "then the two most important functions of an information system become filtration (evaluation) and condensation."⁹²

A major issue in information system design is the total information system concept, which "envision[s] a large centralized data base with very flexible report generating capability to support virtually all decision-making."⁹³

This approach (a single integrated system) has run into all but insuperable practical difficulties in most large-scale, complex organizations, and the reasons are of specific interest here. The whole-system concept requires that everything be understood before anything can be accomplished. It requires one very large scale implementation, which has to be finished before any part of the system will work for anybody. It is vulnerable to blockage by a single constituency. Finally, its development takes a very long time, and during this period there is no apparent payoff to the organization. For all these reasons, a partitioned subsystem is preferable.⁹⁴

⁹⁰ Enarson, p. 172.

⁹¹ Ackhoff, p. 148.

⁹² Ackhoff, p. 148.

⁹³ Schroeder and Adams, p. 120.

⁹⁴ Balderston, "Design and Uses of Information Systems," p. 59.

Cost is also a factor in this approach, and "many institutions will find the cost of a complete, integrated, effective management information system totally outside the realm of the possible. . . ." ⁹⁵

Both the limitations and the potential of management information systems were confirmed in three case studies done at the University of Utah, Ohio State University, and the University of Illinois. ⁹⁶ Acceptance of the system by the users was a problem at all three of the universities. It was "quite difficult to convince high level administrators, some of whom were hostile, of the necessity for such an effort." ⁹⁷ Making the system responsive to needs and educating the users were other problems which were encountered. The installations required a substantial commitment of time and funds. "In the institutions studied, a minimum of four years was required to develop a full management information system." ⁹⁸

The potential of management information systems was also reflected in statements from all three institutions. Planning and resource allocation became more effective.

⁹⁵ Mosmann, p. 138.

⁹⁶ Leo Kornfield, "Three University Case Studies Show Varying Levels of Sophistication with All Systems Go for MIS," College and University Business, L, No. 3 (1971), 33-41.

⁹⁷ Kornfield, p. 38.

⁹⁸ Kornfield, p. 41.

Administrators appeared to be convinced that "intuitive judgments of program quality can be combined with MIS outputs to produce far better decisions than are possible with reliance completely on intuition or reasoning."⁹⁹

Emphasis on the mode of presentation of data from these systems, as a means of improving utilization, can be seen in a further development at one of the schools studied. The University of Utah has recently reviewed their management information system and produced manually a Resource Allocation and Planning Guide.¹⁰⁰ Its purpose was to supplement, analyze and interpret the data for more effective use by management. "The decision to produce a planning and budgeting guide 'manually' represented a deliberate step back and a redirection of efforts . . ."¹⁰¹ to insure a "thoughtful approach to the creation of information designed to aid decision-makers in their planning, organizing and controlling. . . ."¹⁰² Without such careful attention, it is predicted that "management information systems will continue to produce few benefits at increasingly greater costs."¹⁰³

⁹⁹Kornfield, p. 37.

¹⁰⁰Gubasta, pp. 401-411.

¹⁰¹Gubasta, p. 404.

¹⁰²Gubasta, p. 411.

¹⁰³Gubasta, p. 411.

Simulation Models

Much of the effort in the development of "prepackaged" planning tools has been in the area of simulation models. These models attempt to "relate levels of activities to the requirements which they exact on the university's resources."¹⁰⁴ Enrollment projections are translated into "demand for courses, faculty, facilities and support activities. The required resources are then costed and aggregated for various output reports."¹⁰⁵

. . . Simulation models provide the capability to ask "what if" kinds of management planning questions, allow certain policy parameter decisions, and then project the simulated impact of those decisions over a 5 to 10 year period.¹⁰⁶

Simulation models draw more negative than positive comments in the literature. Proponents of the method, while few, see great potential in these models.

The great virtue of the simulation model is its ability to reveal quickly the consequences throughout the university structure of any proposed change in conditions or policies. . . . In fact, it appears that the simulation model is the only practical way of considering the full implications of more than one or two alternative courses of action when a complex decision is involved.¹⁰⁷

¹⁰⁴David Hopkins, "On the Use of Large-Scale Simulation Models for University Planning," Review of Educational Research, XLI (1971), 468.

¹⁰⁵Schroeder, "Survey of Management Science," p. 898.

¹⁰⁶Craven, p. 133.

¹⁰⁷Hamelman, p. 42.

Although a few simulation models "are operational, most of the installations have never passed the pilot test stage. . . . An enormous number of implementation difficulties are typically encountered."¹⁰⁸ Problems in design, excessive cost, and complexity of output are cited as the major handicapping factors. In their design, one of the most troublesome aspects is the "inability to distinguish institutional variables, administrative controls and environmental parameters from one another."¹⁰⁹ The ability of these models to predict future resource requirements is seriously limited by the fact that the coefficients reflect any historical inefficiencies in university operations.¹¹⁰ It is also felt that ". . . critical events outside the university influence the flows of students far more than the percentages derived from past flows."¹¹¹

The collection and processing of data for a simulation model require a major investment of money and time.¹¹² In one example, a university with 50 departments, 7 student levels, 6 faculty ranks and 3 course levels would require 55,350 items of data.¹¹³ "Since it would be purely

¹⁰⁸Schroeder, "Management Systems Design," p. 100.

¹⁰⁹Hopkins, p. 476.

¹¹⁰Hopkins, p. 470.

¹¹¹T. R. Mason, p. 21.

¹¹²Hopkins, p. 472.

¹¹³Hopkins, p. 470.

accidental for these statistics to have been collected in the exact form needed for the model, this is bound to be an expensive and time-consuming venture."¹¹⁴

The complexity of simulation models is a continuing problem. The available models are viewed as having "too many detailed variables and statistics to be of much use in planning. . . ."¹¹⁵ The overwhelming quantity of computer printouts only serves to obscure the understanding of the structural relationships between important variables in the system.¹¹⁶

The consensus of the literature is that simulation models have not proven to be a worthwhile investment.¹¹⁷ Unless there is careful design and high-level organizational commitment, such models "will remain a plaything for the institutional researchers, computer center personnel, and other project leaders, and few significant benefits will be derived from its use."¹¹⁸

Cost Studies

Cost studies involve the calculation of direct and/or indirect costs per unit; i.e., student credit hour, field of

¹¹⁴Hopkins, p. 470.

¹¹⁵Schroeder, "Management Systems Design," p. 100.

¹¹⁶Hopkins, p. 476. ¹¹⁷Schroeder and Adams, p. 121.

¹¹⁸T. R. Mason, p. 31.

major. Cost study results may be used to generate appropriations requests at the state or local level, to evaluate projected costs of new programs, and to make internal management decisions.¹¹⁹ The use of cost analyses to influence resource allocation is a source of continuing concern to faculty and administrators.

Although the relationships among the factors that cause cost differentials in instructional programs have been discussed for decades, . . . widespread use of unit cost data to support policy formulation has not been matched by widespread understanding of the limitations, implications, and fundamental relationships of the numbers that purport to describe institutional program costs.¹²⁰

As in the simulation models, cost studies are affected by the history of expenditures within the institution. The costs may be unrelated to effectiveness, and "decisions about budgets based on costs are limited by this fact."¹²¹ Another limitation in the cost study, as with other tools, is the difficulty of standardizing the data elements. Such variables as FTE student per faculty ratio, work load and course load are interpreted differently by different institutions and efforts to standardize these values are seen as a threat to the diversity of higher education.¹²²

¹¹⁹Tennessee Higher Education Cost Study Report—1975. Nashville: Tennessee Higher Education Commission, 1976, p. 2.

¹²⁰T. R. Mason, p. 54.

¹²¹Dressel, p. 24.

¹²²Earl F. Cheit, "The Management Systems Challenge: How to be Academic through Systematic," Education and the State, ed. John F. Hughes (Washington: American Council on Education, 1975), p. 166.

Cost study data, in combination with other institutional statistics, may assist universities in improving operations and planning, but it has not been "determined through extensive use and investigation how useful the data will really be."¹²³

PPBS, Flow Models and Enrollment Projections

Although considerable effort and publicity have surrounded planning, programming and budgeting systems (PPBS), the "advantages of PPBS have not been realized to date in actual practice."¹²⁴ "At one time there was great hope that PPBS would improve management in institutions of higher education through the development of more output orientation and better planning systems."¹²⁵

One of the main purposes of a planning, programming and budgeting system is to help relate the resource requirements of an organization to its goals. PPBS does this by presenting financial, budgeting, and other resource information by programs that are defined according to the outputs of the organization.¹²⁶

"But output measurement in education is one of the most difficult problems. Although some work has been done, no really satisfactory progress has been made."¹²⁷

¹²³ Heim, p. 39.

¹²⁴ Schroeder and Adams, p. 119.

¹²⁵ Schroeder, "Management Systems Design," p. 100.

¹²⁶ Schroeder and Adams, p. 119.

¹²⁷ Schroeder, "Survey of Management Science," p. 897.

Flow models attempt to give a profile of the movement of selected staff or student groups through the institution. The student flow model can be used to identify factors which correlate highly with student success or failure.¹²⁸ The faculty flow model looks at assumptions regarding retention/attrition rates and how these rates are affected by natural factors (such as deaths and resignations) and policy decisions concerning retirement, promotion and tenure. Although several sophisticated flow models exist, the extent to which they have affected policy decisions in a planning context is unknown.¹²⁹

"Enrollment projection models represent one of the more established tools in higher education management and planning."¹³⁰

A variety of mathematical models exist for assisting university planners in this area, presenting the challenge of selecting techniques which might have the most validity for use at a particular institution. . . . One of the more common statistical approaches to the problem of predicting enrollments has been the use of linear regression models that attempt to identify variables with consistent predictive ability.¹³¹

Despite their importance, the instability of actual enrollment levels has caused many administrators in higher education to use these projections with reservation.¹³² "Since the

¹²⁸Craven, p. 134.

¹²⁹Richardson, pp. 4-5.

¹³⁰Craven, p. 132.

¹³¹Richardson, p. 5.

¹³²Craven, p. 133.

era of relatively stable growth has probably come to an end . . . , work in the area of refining projection models will undoubtedly continue."¹³³

Trends, Research and Recommendations

". . . Relatively little has been done to evaluate the impact of management systems."¹³⁴ Thus the question of whether the work on management systems has produced better management and planning on campuses can only be answered with a tentative yes, based on impressions rather than conclusive evidence.¹³⁵ The degree of interest in management science is stimulating pressure "on each campus to evaluate the adequacy and effects of its own efforts."¹³⁶

Other research interests are being generated by dissatisfaction with current techniques. Frustrations with the complex, comprehensive models have drawn "support for narrower research on specific facets of the system."¹³⁷ Simple models have been found to be both useful and economical, and have encouraged attention to "less ambitious

¹³³ Richardson, p. 5.

¹³⁴ Cheit, p. 157.

¹³⁵ Cheit, p. 157.

¹³⁶ Cheit, p. 156.

¹³⁷ Stephen P. Dresch, "A Critique of Planning Models for Postsecondary Education: Current Feasibility, Potential Relevance, and a Prospectus for Further Research," Journal of Higher Education, XLVI, No. 1 (1975), 249.

(but not less important) studies. . . ."¹³⁸ Through these studies, "we stand to learn a great deal more about the factors which influence the costs of university operations and how these may best be controlled."¹³⁹ "The evolution of planning models shows a distinct trend from large-scale comprehensive models to small and conceptually simple models. . . ."¹⁴⁰

Consistent with this trend is another research interest in common-core data for management. The focus is upon identification of "a minimum set of common-core information that could be collected and kept updated. . . ."¹⁴¹ Information would be included based on its relevancy to the resolution of critical, recurring management questions.¹⁴²

Another research direction is inspired by the difficulties encountered in the integration of systems and tools with the decision process in higher education.

A detailed investigation is needed of what university administrators do and the information which is required for their decisions. At the present time there is not sufficient data available in this regard.¹⁴³

¹³⁸Hopkins, p. 477.

¹³⁹Hopkins, p. 477.

¹⁴⁰T. R. Mason, p. 100.

¹⁴¹Lawrence, p. 78.

¹⁴²Lawrence, p. 78.

¹⁴³Schroeder, "Survey of Management Science," p. 902.

It is suggested that the systems approach used in the development of planning tools be applied to the study of the decision process and related information procedures.¹⁴⁴

Continuing research to improve planning and management is seen as necessary to overcome the limitations of current techniques and the resistance to planning that exists on campuses. Concerns about the centralization of higher education at the state and national levels, and the accompanying constraints on the diversity of higher education, can best be met with the development of an effective institutional planning process.

Failure to develop strong institutional planning procedures invites the imposition of state-conceived models and requirements. Those who complain about increasing state control should review the adequacy of their internal efforts. State-level planning and coordination is most beneficial where there is strong institutional planning backed by accurate data and supported by realism and imaginative analysis.¹⁴⁵

It is unlikely that higher education can retreat from planning and management systems. Administrators, therefore, must be in charge of these efforts, and not at their mercy.¹⁴⁶

Much more so than in the past, the new style of administration will make use of routinely collected, quantitative information. Within the higher education community, decisions will continue to be

¹⁴⁴Schroeder, "Survey of Management Science," p. 903.

¹⁴⁵Richardson, p. 3.

¹⁴⁶Schroeder, "Management Systems Design," p. 106.

based on informed academic judgment rather than on numerical indices, but the indices will be available and can direct attention to possible problem areas.¹⁴⁷

¹⁴⁷Bowen, p. 68.

CHAPTER III

PRESENTATION AND ANALYSIS OF THE DATA

This model for the development of an institutional planning system for the allocation of faculty positions involved two major steps: (1) the identification of a set of commonly used data elements and (2) the assessment of these data elements by the departmental chairmen and other administrators of one institution. The purpose of this chapter is to present a description of the data collection and analysis included in the development process and the resultant Planning Profile format.

Identification of Commonly Used Data Elements

During the review of the literature on the planning process and available planning models, a list was compiled of the types of data considerations frequently involved in planning for the allocation of faculty positions. The identified data elements were divided into two categories: (1) those related specifically to the faculty of the department and (2) those related to more general measures of departmental production. The faculty related data included:

1. Headcount number of full-time and part-time faculty by rank and graduate assistants;

2. Full-time equivalent (FTE) number of full-time and part-time faculty and graduate assistants;
3. Distribution of faculty effort (percent of responsibility in teaching, research, service, etc.);
4. Average teaching load in credit hours;
5. Average teaching load in contact hours;
6. Average number of different preparations per faculty member;
7. Average total credit hour production per FTE faculty member;
8. Average salary by rank; and
9. Tenure analyses by rank.

Other departmental data included the following:

1. Credit hour production history by course level;
2. Projected credit hour production by level;
3. Average class size by level;
4. Headcount student enrollment by level;
5. Number of majors;
6. History of degrees granted (degree profile); and
7. Costs per student credit hour.

No attempt was made to determine common definitions for these data elements. From reports in the literature, it was judged best that the elements be defined at the institutional level as they were applied. In an experiment reported from NCHEMS, a group of experts in institutional

analysis gathered data from five comparable institutions. "It took them two days to define exceptions, limitations, qualifications"¹ in the measure of such information as FTE student per faculty ratio. Meaningful definitions are very difficult to obtain.

The data elements listed above were submitted for review and comment to twenty-five institutions of higher education. Selection of the twenty-five colleges and universities was based on two factors: (1) an indication in the literature of involvement in a planning system; and (2) a minimum headcount enrollment of 10,000 students during the fall term of 1977.² An additional criterion for inclusion in the final analysis of data was a response from the institution that its current planning system had been in use at least three years. Each institution was asked to indicate which of the data elements were considered in their staffing process; if the data elements formed a regular planning system; how long such a system had been in use; their use of "prepackaged" systems; and any specific contributions or limitations of their current process. Opportunity was also given for the survey institutions to describe any additional data elements which were not

¹Schroeder, "Survey of Management Science," p. 897.

²Arthur Podolsky and Carolyn R. Smith, Education Directory: Colleges and Universities, 1977-78 (Washington: U. S. Department of Health, Education and Welfare, 1978).

included in the listing but were a part of their staffing process. The initial letter, followup letter and survey form are in Appendix A.

Twelve institutions completed the survey form and an additional six institutions responded through letters and/or sample planning materials. No response was received from seven institutions. A summary of the responding institutions is shown in Appendix B. Of the twelve institutions which completed the survey form, seven met the criterion that their current planning system had been in use for at least three years. In answer to the questions on the use of the listed data elements in staffing considerations, these seven institutions showed a high degree of agreement. A summary of the responses is shown in Table 1.

Twelve of the fifteen items listed were used by at least half of these seven institutions. Only two of the institutions, the University of Northern Colorado and California State University at Fullerton, indicated use of "prepackaged" materials. Both universities included the Resource Requirements Prediction Model, a costing model from NCHEMS. California State University at Fullerton also indicated use of NCHEMS' student flow model and Induced Course Load Matrix.

TABLE 1

SUMMARY OF RESPONSES FROM SEVEN INSTITUTIONS ON SURVEY OF
DATA ELEMENTS INCLUDED IN STAFFING CONSIDERATIONS

Data Element	Did Include	
	Number	Percent
1. Headcount number of full-time and part-time faculty by rank and graduate assistants	3	43%
2. FTE number of full-time and part-time faculty by rank and graduate assistants	6	86%
3. Distribution of faculty effort	6	86%
4. Average teaching load in credit hours per faculty member	4	57%
5. Average teaching load in contact hours per faculty member	2	29%
6. Average number of different preparations per faculty member	2	29%
7. Average total credit hour production per FTE faculty member	6	86%
8. Average salary by rank	4	57%
9. Tenure analyses by rank	4	57%
10. Credit hour production history by level*	7	100%
11. Projected credit hours by level*	5	71%
12. Average class size by level	5	71%
13. Headcount enrollment by level	5	71%
14. Number of majors	5	71%
15. Degree profile*	3	43%
16. Cost per student credit hour	6	86%

*The period of the historical and projected data (items 10, 11 and 15) was most commonly five years.

A variety of contributions and limitations of planning systems was described in comments from the seven institutions. The contributions included the acceptance of a rational, common basis to begin discussions of staffing and program quality, and increased flexibility in tenure, staffing and recruiting decisions because of prior planning. Recognition that the quantitative data served only as a beginning point for discussion was indicated in comments on specific limitations. The lack of ability to evaluate the quality of research and service activities and the difficulty of giving proper consideration to qualitative factors were cited. Limitations were also seen in the absence of an accurate data base and general understanding of the data elements. The contributions and limitations described by these institutions were very consistent with the differing perspectives on planning that were reflected in the literature.

Assessment of Identified Data Elements by
Department Chairmen, Deans and
Other Administrators

The Assessment Process

Information from the review of the literature and responses from the institutions served as the basis for the design of a survey form sent to all department chairmen, academic deans, the Vice President and the Associate Vice

President for Academic Affairs, the Vice President for Business and Finance, and the Assistant to the President for Planning at Memphis State University. Thirteen items were included on the form; twelve were drawn directly from the response list of the institutions that were surveyed and a thirteenth (headcount number of faculty and graduate assistants) was included because of local institutional practice.

The respondents at Memphis State University were asked to give their assessment of the usefulness of each item as a consideration in the staffing process. The following scale was provided for each item:

- 1 - Unnecessary
- 2 - Perhaps useful, but of questionable value
- 3 - Desirable, would use if available
- 4 - Highly desirable, an essential characteristic.³

Opportunity was provided for additional items to be suggested, either for consideration in a single department or in all departments. The survey form and accompanying letter are shown in Appendix C.

The response on this survey was 100 percent. Forty-two chairmen, four deans, and four other administrators at Memphis State University reviewed the items and returned

³Patrick, p. 20.

the survey forms. Twenty-eight of the respondents offered comments concerning additional items for possible consideration in the staffing process.

The Analysis

Responses from the review were analyzed to determine the extent of agreement among the chairmen, deans and other administrators as follows:

- (a) among the total group of respondents;
- (b) among and between the groups based on level of responsibility;
- (c) among and between the groups based on college affiliation; and
- (d) among and between the groups based on departmental size.

Part A. The initial question to be answered by the analysis of the responses concerned the extent of agreement of the total group on the assessment of the thirteen items. The Kendall coefficient of concordance,⁴ which is used to determine the overall agreement among k sets of rankings, was seen as the most appropriate technique. The correction factor necessary in the case of tied ranks was included in the calculation. Significance for this test was checked at the

⁴Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill, 1956), pp. 229-238.

.01 level. To examine the pattern of responses on individual items, the Kolmogorov-Smirnov one-sample test was used.⁵ This test compares the observed rankings on the items to an assumed distribution. In this case, an equal distribution of rankings, which would be present with random selection, was assumed. Significance of test results was checked at the .05 level.

In this question, analysis with the Kendall coefficient of concordance indicated significant agreement at the .01 level within the total group on the rankings of the thirteen items. The Kolmogorov-Smirnov test revealed significant patterns of responses on nine of the thirteen items (1, 2, 3, 4, 5, 9, 11, 12, and 13). Results from these two analyses, the distribution of responses, and median scores on items with agreement are presented in Table 2.

Part B. This question, and those which follow, relate to the agreement within and among various subgroups of the respondents. The first subgroups to be examined were based on level of responsibility within the institution, with one group consisting of chairmen and a second group consisting of deans and central administration officers. The Kendall coefficient of concordance was used to determine

⁵Siegel, pp. 47-52.

TABLE 2

NUMBER OF RESPONSES FROM CHAIRMEN, DEANS AND ADMINISTRATORS;
MEDIAN RESPONSES; AND RESULTS OF TESTS FOR AGREEMENT

Item	Response Categories*				Median	Significance Results of Kolmogorov-Smirnov One-Sample Test
	4	3	2	1		
1. Headcount Number of Faculty	36	7	5	2	4.00	.05
2. FTE Number of Faculty	38	7	4	1	4.00	.05
3. Distribution of Faculty Effort	32	10	5	3	4.00	.05
4. Average Teaching Load	31	12	5	2	4.00	.05
5. Average Credit Hour Production	28	18	2	2	4.00	.05
6. Average Salary by Rank	12	7	18	13		Not significant
7. Tenure Analyses	10	15	17	8		Not significant
8. Cost Per Student Credit Hour	9	19	18	4		Not significant
9. Credit Hour History	21	18	9	2	3.00	.05
10. Projected Credit Hours	14	15	13	8		Not significant
11. Average Class Size	20	16	12	2	3.00	.05
12. Headcount Enrollment	16	20	13	1	3.00	.05
13. Number of Majors	16	20	13	1	3.00	.05

The results from the Kendall coefficient of concordance test for agreement within the total group was significant at the .01 level.

*Response categories: 1 - Unnecessary
 2 - Perhaps useful, but of questionable value
 3 - Desirable, would use if available
 4 - Highly desirable, an essential characteristic

the extent of agreement on the rankings within each of these two groups. The results indicated significant agreement at the .01 level within both groups.

Since there was agreement within the groups, a valid comparison could be made between the groups to determine if any differences in rankings were present. Median responses were calculated for each item in each group. These median responses were ranked and the Mann Whitney U test⁶ used to check for significant differences in rankings between the two groups. No significant difference in rankings was seen between these two groups. The test results are summarized in Table 3. (As shown in this and the following three tables, the coefficient of concordance is converted to a chi square equivalent when the number of items to be ranked exceeds seven.)

Part C. The initial allocations of faculty positions at Memphis State University are made at the college level. Thus, the analysis in this third question sought to determine if there was significant agreement on the rankings by the chairmen within each of the five colleges. The Kendall coefficient of concordance was again used, both to test for agreement within each college and to test for agreement among colleges as appropriate. The summary of these

⁶Siegel, pp. 116-127.

TABLE 3

ANALYSIS BASED ON LEVEL OF RESPONSIBILITY: RESULTS OF
TESTS FOR AGREEMENT WITHIN AND BETWEEN GROUPS

Group	Number	Value of Kendall Coefficient of Concordance (ω)	Value of Chi Square (χ^2)	Results of Mann Whitney U
All Chairmen	42	.16	80.64*	U = 56.5
				z = 1.55
Deans and Central Administration	8	.50	47.90*	p = .12

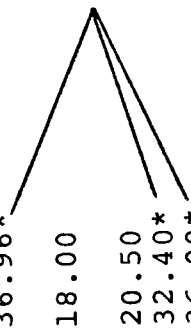
*Significant at .01 level.

analyses, shown in Table 4, indicates significant agreement, at the .01 level, within each of three colleges: Arts and Sciences, Education and Engineering. Agreement was not seen within the colleges of Business Administration and Communication and Fine Arts. Testing the extent of concordance among the three colleges which showed internal agreement revealed a significant amount of agreement, at the .01 level, on the rankings of the thirteen items under consideration.

Part D. The analysis in this fourth question considered the possible impact of the size of a department (measured in FTE faculty) on the assessments of the staffing items by department chairmen. The department chairmen were divided into four groups based on the number of FTE faculty in the department. The group classifications were (1) $FTE \leq 10.99$; (2) $11 \leq FTE \leq 20.99$; (3) $21 \leq FTE \leq 30.99$; and (4) $FTE \geq 31$. Using the Kendall coefficient of concordance, significant agreement, at the .01 level, was seen within two groups of chairmen, those with smaller departments ($FTE \leq 10.99$), and those with moderately large departments ($21 \leq FTE \leq 30.99$). A summary of the analysis can be seen in Table 5. Using the Mann Whitney U test, the thirteen median responses from each of the two groups showing agreement were compared. This analysis indicated no significant differences in their assessments of the items.

TABLE 4

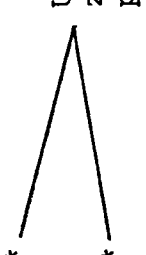
ANALYSIS BASED ON COLLEGE AFFILIATION: RESULTS OF TESTS FOR
AGREEMENT WITHIN AND AMONG GROUPS

Group	Number	Within Group		Within Group		Among Groups	
		Value of Kendall Coefficient of Concordance (ω)	Value of Chi Square (χ^2)	Value of Chi Square (χ^2)	Value of (ω)	Value of (χ^2)	
Arts and Sciences	14	.22		36.96*		30.90*	
Business	6	.25		18.00			
Administration and Communication and	4	.43		20.50			
Fine Arts	9	.30		32.40*			
Education	5	.60		36.00*			
Engineering							

*Significant at .01 level.

TABLE 5

ANALYSIS BASED ON DEPARTMENTAL SIZE: RESULTS OF TESTS FOR
AGREEMENT WITHIN AND BETWEEN GROUPS

Group	Number	<u>Within Group</u>	<u>Within Group</u>	<u>Between Groups</u>	
		Value of	Value of	Results of	
		Kendall Coefficient of Concordance (ω)	Chi Square (χ^2)	Mann Whitney U	
FTE $\leq$ 10.99	16	.29	56.20*		
11 $\leq$ FTE $\leq$ 20.99	9	.12	12.61		U = 63.5
21 $\leq$ FTE $\leq$ 30.99	11	.21	27.46*		z = 1.14
FTE $\geq$ 31	6	.15	10.98		p = .25

*Significant at .01 level.

Two of the groups of chairmen, those with a departmental faculty greater than or equal to 11 and less than or equal to 20.99, and those with a faculty greater than or equal to 31, did not show significant agreement on the rankings of the items. Thus, departmental size was not a consistent determinant of agreement or disagreement on the criteria to be considered in staffing allocations.

Summary of Comments

Twenty-eight of the survey respondents gave suggestions or comments for items to be considered in the staffing process. The most frequent type of suggestion (eleven instances) focused on unique program factors not adequately reflected in the present arrangement of quantitative elements. Examples included were the special staffing demands of intern programs; graduate science programs with numerous laboratory courses; the implementation of new programs; specialized offerings in the arts and health professions; and departments which contain and must staff for more than one major program area. Examples of the latter included Finance, Insurance and Real Estate, and Health, Physical Education and Recreation.

The next most frequent type of comment (six instances) was concerned with trend analyses in areas other than credit hour production. Specific items suggested for trend analysis

were number of graduates, number of majors, and number of FTE faculty.

The last type of comment which appeared with more than one occurrence (four instances) indicated a need for comparative information. Chairmen have been furnished with data pertaining only to their department. These comments asked for college and university comparative information, including specific information on other departments within their respective colleges.

Factor Analysis

Stressed in the literature was the fact that the mode and format of data presentation can have an important impact on utilization. To assist in designing a format for the data elements, a factor analysis was run on the responses to the thirteen items. The factor analysis program was repeated three times with options for two factors, three factors, and four factors.

The results were very consistent and showed three separate factors made up of the nine items agreed upon by the respondents. A fourth factor consisted of three of the items on which there was not significant agreement. Factor one contained items 8, 9, 11, 12 and 13; factor two contained items 1, 2, 4, and 5; factor three contained items 6, 7, and 10; and factor four was a single item, number 3. The distribution of factor scores for these

four factors is shown in Table 6. Each factor score shows the correlation of the item with the factor. The items in each factor are listed and described in Table 7.

The first factor is centered on such student related data as student credit hours, enrollment and majors. These items were clustered on the Planning Profile (shown in Appendix D) used in staffing considerations. The information on cost per student credit hour was excluded from the Profile since the analysis did not show agreement among the respondents on the usefulness of the item.

A second factor was centered on faculty data. This factor included the headcount and FTE number of faculty, the average teaching load and the average credit hour production per FTE faculty member. These items were clustered in another section of the Planning Profile.

The third factor consisted of three items: average salary, tenure analyses and projected credit hours. There was no significant pattern of agreement on the rankings of these items by the respondents. Two of the items, average salary and tenure analyses, were not included in the Profile data. The third, projected credit hours, was included by administrative choice.

Information on the distribution of faculty effort stood alone as a fourth factor. The percent of effort in each of six categories was shown at the bottom of the Profile.

TABLE 6

DISTRIBUTION OF FACTOR SCORES WITH FOUR FACTORS AND
THIRTEEN STAFFING DATA ITEMS

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
1. Headcount Number of Faculty	-.06241	<u>.55748</u>	.16253	.06854
2. FTE Number of Faculty	.20292	<u>.67310</u>	-.05262	-.09869
3. Distribution of Faculty Effort	.10016	.14087	.03766	<u>.64932</u>
4. Average Teaching Load	-.02691	<u>.65099</u>	.06142	.39546
5. Average Credit Hour Production	.15079	<u>.76251</u>	.01307	.15157
6. Average Salary by Rank	.21402	.12475	<u>.63642</u>	.33461
7. Tenure Analyses	.15953	.13966	<u>.85730</u>	-.12431
8. Cost Per Student Credit Hour	<u>.64664</u>	.18574	.08722	-.06977
9. Credit Hour History	<u>.51223</u>	.09459	.22260	.23515
10. Projected Credit Hours	.40376	-.12340	<u>.49881</u>	.07753
11. Average Class Size	<u>.43600</u>	.26061	.26439	.26636
12. Headcount Enrollment	<u>.78111</u>	-.01156	.17754	.34816
13. Number of Majors	<u>.63752</u>	-.01501	.10394	-.05979

TABLE 7

FACTOR GROUPINGS OF THE THIRTEEN DATA ELEMENTS
UNDER THE FOUR FACTOR OPTION

<u>FACTOR 1</u>		<u>FACTOR 2</u>	
8.	Cost per student credit hour	1.	Headcount number of faculty
9.	Credit hour history	2.	FTE number of faculty
11.	Average class size	4.	Average teaching load
12.	Headcount enrollment	5.	Average credit hour production
13.	Number of majors		
<u>FACTOR 3</u>		<u>FACTOR 4</u>	
6.	Average salary by rank	3.	Distribution of faculty effort
7.	Tenure analyses		
10.	Projected credit hours		

Two additional items were included in the final Profile, again by administrative choice. One was the actual credit hour production by level and by faculty classification (full-time, part-time or graduate assistant). This information was the basis for calculation of average credit hour production per FTE faculty member, which was present in the second factor. The breakout by course level and faculty classification provided information on the utilization of part-time faculty and teaching graduate assistants. The second item included was a projection of FTE faculty needs. The projection was based on projected credit hours and the average credit hour production per FTE faculty member. This information served chiefly to draw attention to variances in average credit hour production at the department, college and university level.

The Planning Profile was used extensively in staffing hearings and considerations during the 1978-79 academic year at Memphis State University. Supplementing the Profile information at the staffing hearings were reports on faculty involvement in continuing education and public service, data on the actual teaching load of each faculty member, and discussion of research efforts and program direction and quality within each department.

CHAPTER IV

SUMMARY AND IMPLICATIONS

The criteria for effective planning procedures, identified through the review of literature, were "simplicity, flexibility, . . . and provision for meaningful participation . . ." ¹ by those concerned. These criteria were an integral part of the development of this model for a "Planning Profile" to assist in the allocation of faculty positions. The purpose of this concluding chapter is to present an overview of the model through (1) a review of the procedures; (2) a summary of findings; and (3) implications for utilization and further development of the model.

Review of Procedures

The initial step in the development was a review of the literature relating to the potential and limitations of planning procedures in higher education and the analytical tools which have been designed to assist in the process. As a part of this review, a list was compiled of data elements which were frequently used in planning techniques and models related to staffing in the academic departments. Also compiled was a list of higher education institutions

¹Patrick, p. 20.

which, from descriptions in the literature, were involved in a planning system. The data elements from the literature were submitted to these institutions for review and comment. This process identified twelve items used by at least half of the responding institutions in their staffing considerations.

These twelve items, plus one additional item included because of local institutional practice, were submitted to the chairmen, deans and selected administrators at Memphis State University. The thirteen items were ranked on the degree of their usefulness in staffing considerations. The results of this survey were analyzed, testing responses from the total group and various subgroups. From these analyses, a "Planning Profile" was developed for use in staffing considerations at Memphis State University.

Summary of Findings

Review of the Literature

Four major points, which are summarized below, were identified in the review of the literature.

1. The role of planning in higher education has assumed more importance as the previous period of growth has been replaced with a steady decline in enrollments and restrictions upon resources.

2. Analytical tools and techniques which have been developed to assist in the planning process have poor implementation records due to excessive costs, complex and inflexible formats and lack of consideration of the unique decision-making structure of higher education.

3. Assessments of the present and potential role of planning and planning tools varied from the positive viewpoints of the developers and researchers in this field to the more negative viewpoints of administrators who must use the models and implement the plans.

4. Research emphases for the future include attention to the decision-making process, the identification of common-core data for management, and the development and testing of small and conceptually simple planning models.

Survey of Institutions

Responses from institutions with experience in planning contributed to the study in two ways: (1) the potentials and limitations of planning described in the literature were confirmed through the comments and examples given in the responses, and (2) a core of data elements commonly used in staffing considerations was identified.

Survey of Chairmen, Deans and Selected
Other Administrators

Analyses of the rankings of the core data elements by the chairmen, deans and selected other administrators at Memphis State University yielded the following results.

Analysis of total group

1. There was significant agreement among the total group of respondents on the rankings of the data elements.
2. Nine of the thirteen data elements had significant patterns of responses which indicated agreement upon their degree of usefulness in staffing considerations.

Analysis by level of responsibility

1. There was significant agreement among the chairmen on the rankings of the data elements.
2. There was significant agreement among the deans and administrators on the rankings of the data elements.
3. There was no significant difference between the median rankings on the data elements from these two groups (a. chairmen and b. deans and administrators) with different levels of responsibility.

Analysis by college affiliation. The chairmen were divided into five groups based on college affiliation. Each group was analyzed separately for agreement. Median rankings from the colleges in which agreement was significant were then compared.

1. There was significant agreement within the groups of chairmen from three colleges: Arts and Sciences, Education and Engineering.

2. There was not significant agreement within the groups of chairmen from two colleges: Communication and Fine Arts and Business Administration.

3. There was no significant difference among the median rankings of the three colleges which showed internal agreement: Arts and Sciences, Education and Engineering.

Analysis by departmental size. The chairmen were divided into four groups based on departmental size measured in number of FTE faculty. The size categories were:
(1) $FTE \leq 10.99$; (2) $11 \leq FTE \leq 20.99$; (3) $21 \leq FTE \leq 30.99$; and (4) $FTE \geq 31$.

1. There was significant agreement within the groups of chairmen from departments in categories one and three.

2. There was no significant agreement within the groups of chairmen from departments in categories two and four.

3. There was no significant difference between the median rankings of the groups of chairmen from departments in categories one and three.

Summary of comments. Twenty-eight of the respondents included suggestions for additional considerations in the

staffing process. Most frequently mentioned for inclusion were unique program considerations. More trend analyses on data such as graduates, majors and number of FTE faculty was another suggestion. Also included in the comments were requests for comparative information at the department, college and university level.

Factor analysis. The purpose of the factor analysis was to assist in the design of a format for the presentation of the data elements. Four factors were identified. The first factor included student related data (majors, headcount enrollment, average class size, credit hour production history, and cost per student credit hour). The second factor was identified as faculty related and included the headcount and FTE number of faculty, average teaching load, and average credit hour production. A third factor consisted of three elements on which there was no significant agreement by the respondents. These were average salary, tenure analyses, and projected credit hours. The final factor had one element, the distribution of faculty effort.

Implications

The extent of agreement found in the assessments of the data elements by the chairmen, deans and administrators supports the feasibility of broad-based participation

in the development of a planning system. As well as revealing areas of agreement, the process allows for the monitoring of possible areas of disagreement which might require further study or discussion.

In this particular implementation, a common basis for beginning staffing considerations could be seen in the agreement present in the rankings by those in the two different levels of responsibility which were examined. However, differences within the responses from two of the colleges indicated a need for further discussion and study in those areas.

Another factor considered, that of departmental size, was not a consistent determinant of agreement or disagreement on the rankings. Thus, in this study no distinction in staffing criteria could be made for departments of varying sizes.

Comments from chairmen, deans and other administrators not only produced suggestions for additional data considerations, but also emphasized factors involving the structure and quality of departmental programs. These factors added new dimensions to the interpretation and utilization of the data elements and served as a potential for individualizing profiles to meet differing departmental needs.

The comments and notes which accompanied the rankings were also evidence of more careful consideration of a

broader range of staffing criteria. Implementation of this review process, in conjunction with presentation of the information in a simple and flexible format, may serve to encourage the use of additional criteria which can assist in the evaluation of staffing needs. Rather than focusing on one measure, such as credit hour production, the chairmen, deans and other administrators may, through participation in the process, become more familiar with and better able to use a variety of staffing indices.

Experience with the development of this model suggests that it may be easily adapted at other institutions. Working with the identified data elements and the outlined review and analysis process, an institution could construct a Planning Profile which reflected its own unique needs and viewpoints concerning staffing.

Further development of the model at any institution might include a regular, perhaps biennial, reassessment of the items by the chairmen, deans and other administrators. As the environment and resources of the university change and as occupants of leadership positions change, the assessments of criteria for staffing considerations might also be subject to change. Since the review process is neither costly nor time-consuming and the Profile format is flexible, a regular review of criteria would be a practical means of assuring continuing participation

in the selection of staffing criteria within a responsive planning system.

BIBLIOGRAPHY

BIBLIOGRAPHY

A. BOOKS

- Balderston, Frederick E. Managing Today's University. San Francisco: Jossey-Bass, Inc., 1974.
- Bolin, John G., ed. Management Information for College Administrators. Athens: University of Georgia, Institute of Higher Education, 1971.
- Bowen, Frank M. and Lyman A. Glenny. State Budgeting for Higher Education: State Fiscal Stringency and Public Higher Education. Berkeley: University of California, Center for Research and Development in Higher Education, 1976.
- Casasco, Juan A. Planning Techniques for University Management. Washington: American Council on Education, 1970.
- Hamelman, Paul W., ed. Managing the University: A Systems Approach. New York: Praeger Publishers, 1972.
- Hefferlin, J. B. and Ellis L. Phillips, Jr. Information Services for Academic Administration. San Francisco: Jossey-Bass, Inc., 1971.
- Hughes, John F., ed. Education and the State. Washington: American Council on Education, 1975.
- Johnson, Charles B. and William G. Katzenmeyer. Management Information Systems in Higher Education: The State of the Art. North Carolina: Duke University Press, 1969.
- Kieft, Raymond N. Academic Planning: Four Institutional Case Studies. Boulder: NCHEMS, 1978.
- Kieft, Raymond N., Frank Armijo, and Neil S. Bucklew. A Handbook for Institutional Academic and Program Planning: From Idea to Implementation. Boulder: NCHEMS, 1978.

Lawrence, G. Ben, and Allan L. Service, eds. Quantitative Approaches to Higher Education Management: Potential, Limits, and Challenge. Washington: American Association for Higher Education, 1977.

Mosmann, Charles J. Academic Computers in Service. San Francisco: Jossey-Bass, Inc., 1973.

Podolsky, Arthur and Carolyn R. Smith. Education Directory: Colleges and Universities, 1977-78. Washington: U. S. Department of Health, Education and Welfare, 1978.

Rourke, Francis E. and Glenn E. Brooks. The Managerial Revolution in Higher Education. Maryland: The Johns Hopkins Press, 1966.

Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill, 1965.

B. JOURNALS AND PERIODICALS

Ackhoff, Russell L. "Management Misinformation." Management Science, XIV, No. 4 (1967), B147-156.

Ames, Michael D. "Costing and Data Management: Development of a Simplified System for Smaller Colleges and Universities." Journal of Higher Education, XLVII, No. 5 (1976), 589-605.

Adams, Carl R., Theodore E. Kellogg, and Roger G. Schroeder. "Decision-Making and Information Systems in Colleges: An Exploratory Study." Journal of Higher Education, XLVII (January/February 1976), 33-49.

Alm, Kent G., Elwood B. Ehrle and Bill R. Webster. "Managing Faculty Reductions." Journal of Higher Education, XLVIII, No. 2 (1977), 153-163.

Argyris, Chris. "Management Information Systems: The Challenge to Rationality and Emotionality." Management Science, XVI, No. 6 (1971), B275-292.

Craven, Eugene C. "Information Decision Systems in Higher Education: A Conceptual Framework." Journal of Higher Education, XLVI, No. 2 (1975), 125-138.

Diran, Kevin M. "Management Information Systems: The Human Factor." Journal of Higher Education, XLIX, No. 3 (1978), 273-282.

- Dresch, Stephen P. "A Critique of Planning Models for Postsecondary Education: Current Feasibility, Potential Relevance, and a Prospectus for Further Research." Journal of Higher Education, XLVI, No. 1 (1975), 245-286.
- Enarson, Harold L. "The Art of Planning." Educational Record, LVI (1975), 170-174.
- Gubasta, Joseph L., and Norman Kaufman. "Developing Information Systems for Academic Management: An Alternative to Computer-Based Systems." Journal of Higher Education, XLVIII, No. 4 (1977), 401-411.
- Green, E. J. and P. C. Winstead. "Systematic Institutional Planning." Educational Technology, XV (July 1975), 33-35.
- Hines, Gail S. "Why University Management Information Systems Have Failed." Journal of Educational Data Processing, XIV, No. 3 (1977), 1-7.
- Hoerack, Stephen and others. "University Planning, Decentralization and Resource Allocation." Socio-Economic Planning Sciences, VIII, No. 5 (1974), 257-272.
- Hopkins, David. "On the Use of Large-scale Simulation Models for University Planning." Review of Educational Research, XLI (1971), 467-478.
- Kornfield, Leo. "Three University Case Studies Show Varying Levels of Sophistication with All Systems Go for MIS." College and University Business, L, No. 3 (1971), 33-41.
- Mason, Richard O., and Ian I. Mitroff. "A Program for Research on Management Information Systems." Management Science, XIX, No. 5 (1973), 475-487.
- McNamara, James F. "Mathematical Programming Models in Educational Planning." Review of Educational Research, XLI (December 1971), 419-446.
- Minter, John, and Charles Thomas, eds. "RRPM-1 Model Gives Hard Answers to 'What If?'." Higher Education Management, I, No. 2 (1971), 1-3.
- Mowbray, George, and Jack B. Levine. "The Development and Implementation of CAMPUS: A Computer-Based Planning and Budgeting System for Universities and Colleges." Educational Technology, XI, No. 5 (1971), 27-32.

- Patrick, Joseph, and Joseph Harold. "MIS Revisited." Journal of Educational Data Processing, XIII, No. 1 (1976), 18-20.
- Richardson, Richard C., Don E. Gardiner, and Ann Pierce. "The Need for Institutional Planning." College and University Bulletin, XXX, No. 1 (1977), 3-6.
- Scherer, N. D. and others. "Management Information Systems: Changing Institutional Behavior." College and University, LI (Summer 1976), 668-679.
- Schroeder, Roger G. "A Survey of Management Science in University Operations." Management Science, XIX (April 1973), 895-906.
- Schroeder, Roger G., and Carl R. Adams. "The Effective Use of Management Science in University Administration." Review of Educational Research, XLVI (1976), 117-131.
- Wagner, J. P. "Simulation Model for Planning in an Institution of Higher Education." College and University, LII (Fall 1976), 5-20.
- Wyatt, Joe B., and Sally Zeckhauser. "University Executives and Management Information: A Tenuous Relationship." Educational Record, LVI (Summer 1975), 175-189.

C. MISCELLANEOUS

- Adams, Carl R., ed. Appraising Information Needs of Decision Makers, No. 15, New Directions for Institutional Research. San Francisco: Jossey-Bass, Inc., 1977.
- Berquist, William H., and William A. Shoemaker, eds. A Comprehensive Approach to Institutional Development, No. 15, New Directions for Higher Education. San Francisco: Jossey-Bass, Inc., 1976.
- Bowen, Howard, ed. Evaluating Institutions for Accountability, No. 1, New Directions for Institutional Research. San Francisco: Jossey-Bass, Inc., 1974.
- Cartter, Allan M., ed. Assuring Academic Progress Without Growth, No. 6, New Directions for Institutional Research. San Francisco: Jossey-Bass, Inc., 1975.

- Collard, William, and Robert Huff. Exploring Cost Exchanges at Colleges and Universities. A Report on the 1973 Field Test of NCHEM's Preliminary Information Exchange and Reporting Procedures at 70 Institutions. Boulder: NCHEMS at WICHE, 1974.
- Cope, Robert G., ed. Tomorrow's Imperatives Today. Proceedings of the 13th Annual Forum of AIR, Vancouver, British Columbia. Washington: Association for Institutional Research, 1973.
- Dressel, Paul and Lou Anna Kimsey Simon, eds. Allocating Resources Among Departments, No. 11, New Directions for Institutional Research. San Francisco: Jossey-Bass, Inc., 1976.
- Huff, Robert A., and Michael E. Young. Profiles of Management Information Uses. A Report on How Twelve Institutions Have Used Data from NCHEMS Management Information System. Boulder: NCHEMS, May, 1974.
- Johnson, William, ed. Information and Analysis in the Context of Institutional-State Relationships: The Tie That Divides Us, Proceedings of the 1976 National Assembly of the National Center for Higher Education Management Systems. Boulder: NCHEMS at WICHE, 1976.
- Mason, Thomas R., ed. Assessing Computer-Based Systems Models, No. 9, New Directions for Institutional Research. San Francisco: Jossey-Bass, Inc., 1976.
- Millard, Richard M., and Associates, eds. Information Impact: Collision with Tradition. Proceedings of the 2nd National Forum on New Planning and Management Practices in Postsecondary Education. Chicago, November 14-16, 1973.
- Miyataki, Glenn K., and Robert G. Gray. Academic Unit Planning Manual—Field Review Edition, Technical Report No. 72. Boulder: NCHEMS at WICHE, January, 1975.
- NCHEMS. A Brochure by the National Center for Higher Education Management Systems, Boulder, Colorado, 1978.
- Representatives, Communications Department. Telephone Interview. Boulder, Colorado, January 10, 1979.
- Schroeder, Roger G. and David Hopkins, eds. Applying Analytic Methods to Planning and Management, No. 13, New Directions for Institutional Research. San Francisco: Jossey-Bass, Inc., 1977.

Tennessee Higher Education Cost Study Report—1975.
Nashville: Tennessee Higher Education Commission,
1976. (Mimeographed).

WICHE, Annual Report, 1975. Boulder: Western Interstate
Commission for Higher Education, 1976.

Ziemer, Gordon. "Action Report: Fiscal Affairs and
Operations Committee." Boulder: National Center
for Higher Education Management Systems, July, 1978,
Board Agenda (Mimeographed).

APPENDIXES

APPENDIX A



MEMPHIS STATE UNIVERSITY
MEMPHIS, TENNESSEE 38152

Office of the Vice President
for
Academic Affairs

Telephone: 901/454-2119

September 9, 1978

Dr. Richard W. Burkhardt
Vice President for Instructional Affairs
Ball State University
Muncie, Indiana 47306

Dear Dr. Burkhardt:

In conjunction with an increased emphasis on planning at Memphis State University and a related doctoral research project, we are asking your assistance in furnishing information on the planning process at Ball State University. A publication by WICHE* indicated there was both interest and experience in planning at your University.

The focus of the related dissertation research is an overview of planning systems currently in use and the development of a planning tool to assist in departmental staffing decisions at Memphis State University. The basic information requested here concerns the structure and content of any active planning system, guide or technique which has proven valuable at your institution in staffing decisions.

Specific items of interest are listed on the attached sheet. It would also be particularly helpful if you could furnish a sample departmental analysis or other report which would indicate the major data elements used in staffing considerations.

As a researcher in this area and an Academic Affairs staff member, I appreciate your help in this project.

Sincerely,

Martha Porter, Associate Director
Administrative Planning - Academic Affairs

*

An Equal Opportunity University



MEMPHIS STATE UNIVERSITY
MEMPHIS, TENNESSEE 38152

Office of the Vice President
for
Academic Affairs

Telephone: 901/454-2119

Attached is a copy of a survey instrument we mailed to you in late September. Initial returns have been very helpful and have reinforced our original view of the importance of this study for our institution.

Preparation for our staffing hearings, in which these data are to be used, will begin soon. Your response would be most helpful and would assist in greater reliability of our conclusions.

As stated before, we are interested in identifying the data elements which are used consistently by central administration in reviewing the staffing patterns and needs of the academic departments.

Won't you assist us in this project by completing the attached form and returning it to our office? We will greatly appreciate your response.

Sincerely,

Martha Porter, Associate Director
Administrative Planning - Academic Affairs

- 1) Which of the following data elements or factors are included in staffing considerations for the number and distribution of full-time and part-time faculty and graduate assistants in the academic departments? (If this information is fully furnished through an enclosed sample departmental analysis or other report, then skip to #2 on the back of this page.)

FACULTY PROFILE

- ___ Number of full-time and part-time faculty by rank and graduate assistants (headcount number)
- ___ Number of full-time and part-time faculty by rank and graduate assistants (full-time equivalent number)
- ___ Distribution of faculty effort (percent of responsibility in teaching, research, service, etc.)
- ___ Average teaching load in credit hours per faculty member
- ___ Average teaching load in contact hours per faculty member
- ___ Average number of different preparations per faculty member
- ___ Average total credit hour production per FTE faculty member
- ___ Average salary by rank
- ___ Tenure Analyses (Percent by rank)
- ___ Other _____
- _____
- _____
- _____

DEPARTMENT PROFILE

- ___ Credit hour production history by level (lower division, upper division, graduate) for ____ years
- ___ Projected credit hours by level for ____ year(s)
- ___ Average class size by level
- ___ Headcount enrollment by level
- ___ Number of majors
- ___ Degree profile (number of degrees by major for ____ years)
- ___ Other _____
- _____
- _____
- _____

COST ANALYSES, SIMULATIONS, FLOW MODELS, ETC. (Please describe, enclose sample report or give reference to system manual)

- 2) Do the data elements indicated form a regular planning system used as an aid in staffing decisions for the academic departments?

☐ Yes ☐ No

- 3) How many years has this system or set of considerations been in use?
_____ Years

- 4) Was any part of your current system purchased or acquired from an outside developer (NCHEMS, HEPS, HELP/PLANTRAN, etc.)?

☐ Yes ☐ No

If YES, name of developer and system _____

- 5) What specific contributions to the staffing process do you see from your current system or process?

- 6) What specific limitations do you see in your current system or process?

Please return to:
Martha Porter
Academic Affairs
Memphis State University
Memphis, Tennessee 38152

APPENDIX B

TABLE 8
RESPONSE RECORD FOR INSTITUTIONAL SURVEY

Institution	Enrollment	Form Returned	Letter or Other	3 Year Test	
University of Pittsburgh	29,444		X		
Arizona State University	34,366	X		?	
Illinois State University	20,443	X		X	**
University of Utah	21,661	---	---	---	
University of Illinois— Chicago	21,252		X		
University of Illinois— Urbana	33,552	X		X	**
Ball State University	17,547	X		2	
Ohio State University	49,982	---	---	---	
University of Colorado— Boulder	21,061	X		2	
University of New Mexico	21,912	---	---	---	
University of Northern Colorado	10,965	X		X	**
Harvard University	20,185	X		X	**
University of Washington	35,277	---	---	---	
SUNY—Stony Brook	15,350	---	---	---	
University of Georgia	22,879		X		
Oregon State University	16,408	X		?	
Mankato State University	12,602	---	---	---	
University of Miami— Coral Gables	14,563	X		?	
California State University at Fullerton	21,989	X		X	**
Stanford University	12,683		X		
Indiana University	32,921	X		X	**
Michigan State University	46,921	X		X	**
University of Minnesota	64,162		X		
CUNY—Brooklyn	24,114	---	---	---	

**Included in Final Data Analysis.

APPENDIX C

MEMPHIS STATE UNIVERSITY

Memorandum

To:

From: Martha Porter, Academic Affairs *Martha*

Subject: Review of Planning Profile for Staffing Hearings - 1978

Date: November 21, 1978

The Planning Profiles, which serve as a source of data in the staffing hearings each year, are being reviewed and analyzed for possible changes in content and format. We are asking your help in this review process.

The purpose is to facilitate the planning process within the departments and colleges and to develop a planning tool which can be both useful and flexible.

Attached is a list of data elements which are commonly used in staffing considerations. Space is provided for you to indicate your judgment about each of these elements. You may also suggest for inclusion any other data elements which you feel would be useful. These suggestions may be specific to your department (based on a unique program feature or structure), or generalized (pertinent for all departments).

Your responses should be returned to Martha Porter, Academic Affairs, by November 27. If you have any questions, please feel free to call (#2513).

STAFFING HEARINGS --- 1978

The following items are commonly considered in staffing decisions. Please indicate your assessment of the usefulness of each of these items in the staffing process, using the scale to the right. On the back of this page, you may suggest other items which you feel should be considered for either (1) your department only due to some unique program feature or (2) all departments.

	Highly desirable, an essential characteristic 4	Desirable, would use if available 3	Perhaps useful, but of questionable value 2	Unnecessary 1
1. HEADCOUNT NUMBER - full-time and part-time faculty by rank and graduate assistants	—	—	—	—
2. FULL-TIME EQUIVALENT NUMBER - full-time and part-time faculty by rank and graduate assistants	—	—	—	—
3. Distribution of faculty effort (percent of responsibility in teaching, research, service, etc. from the Faculty Planning Records)	—	—	—	—
4. Average <u>teaching load</u> in credit hours per faculty member (example: 10.8/15 per faculty member)	—	—	—	—
5. Average <u>total credit hour production</u> per FTE faculty member (example: 226 credit hours per faculty member)	—	—	—	—
6. Average salary by rank	—	—	—	—
7. Tenure analyses (percent by rank)	—	—	—	—
8. Cost per student credit hour by level from the Unit Cost Study	—	—	—	—
9. Credit hour production by level for 5 years	—	—	—	—
10. Projected credit hours by level for one year	—	—	—	—
11. Average class size by level	—	—	—	—
12. Headcount enrollment by level	—	—	—	—
13. Number of majors in the department	—	—	—	—

ADDITIONAL STAFFING DATA FOR YOUR DEPARTMENT:

ADDITIONAL STAFFING DATA FOR ALL DEPARTMENTS:

Please return to:

Martha Porter
Academic Affairs by Monday, November 27

APPENDIX D

English

PROJECTED STAFF PATTERNS

	Total	FTE Teaching	Instructional FTE	Research/ Service Grad.Asst.	TOTAL FTE
Professor					
Associate Professor					
Instructor					
Full-time PT/Adjunct Grad.Asst.					

Average Credit Hour Production by Level

Total Credit Hour Production by Level and Faculty Classification - 1978

Credit Hour Production by Level -- Fall 1974 through Projected Fall 1973

Percent Distribution of Faculty Effort

Instr.	Thesis	Advising	Research	Admin.	Academic	Cont.Ed./	Univ.
85		1	5	5		1	3

Headcount Enrollment

Number of Majors

Undergraduate	102
Graduate	39
Total	141

VITA

Martha Lynn Porter was born in 1946 in Mississippi. She attended public schools in Memphis, Tennessee, graduating from Treadwell High School in 1964. She earned the Bachelor of Science degree with a major in Secondary Education from Memphis State University in 1967. Teaching certification was received in mathematics and English. She earned a Master of Science in Education degree from Memphis State University in 1968, with a major in Educational Administration and certification as principal in grades 7-12 in the state of Tennessee.

Initial employment was in the Memphis City Schools as a junior high mathematics teacher. Subsequent employment in the city system was in senior high mathematics. Tenure was received in 1970.

Higher education employment began in September of 1970 as a research associate in Institutional Research at Memphis State University. Subsequent staff experiences have been in the office of the Vice President for Administration and Planning (1972) and the office of the Vice President for Academic Affairs (1975).

Doctoral work began in the fall of 1976, with a grant in aid and leave of absence from Memphis State University. The Doctor of Education program, with a major in educational

administration and supervision and collaterals in higher education and statistics, was completed in 1979.