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ABSTRACT

Management Information Systems (MIS) for higher education were a product of the growth era. Their purpose was to provide an orderly response to growth needs, translating additional student numbers into requirements for faculty, facilities, and even additional campuses. But now growth is over for most institutions. The ability of MIS to meet reverse needs and accommodate retrenchment is being tested. Contained in this document are factors favoring the expansion of MIS; comparability in MIS; use of academic programs as cost centers; the cost and the benefits of MIS; planning primary programs; personnel staffing criteria; support program goals and planning; control of operations; and leadership and MIS. (Author/PG)

MANAGEMENT INFORMATION SYSTEMS AND THE ACADEMIC ADMINISTRATOR IN A NO-GROWTH ENTERPRISE

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PREFACE

A no-growth era extending into the next century is visible for tertiary education. Peak enrollments are passing through the elementary schools and are now in the seventh grade. While there are still brave hopes of expanding the total clientele particularly with adults, these prospects are dampened by lower high school retention rates, and a reduced participation in tertiary education by high school graduates. What new strategies must be developed for institutions whose operating budgets for thirty years have been balanced by anticipating growth.

Management Information Systems for higher education were a product of the growth era. Their purpose was to provide an orderly response to growth needs, translating additional student numbers into requirements for faculty, facilities, and even additional campuses.

But now growth is over for most institutions. The ability of Management Information Systems to meet reverse needs and accommodate retrenchment, and plateauing, is being tested. It is an entirely new experience, one which will be widely shared throughout our economy as we seek to adjust to zero population growth, achieve a stable environment, and prevent accelerated depletion of our natural resources. For higher education it means maintaining a vigorous, stimulating environment without the crutch of growth. And this means using available resources much more carefully. This is the fundamental purpose of Management Information Systems.

MIS AND THE ACADEMIC ADMINISTRATOR

Foreward

Management Information Systems are being proposed as the new and required link between the federal and state legislators who must decide on the share-of-the-pie, and the Higher Education Enterprise who believe they need more. The legislative decision makers are faced with the increased competition for public monies. The Higher Education Enterprise sees an increasingly complex world in which more people need more preparation to contribute and to cope. And in the background is the statistic that Higher Education's share of the Gross National Product has already moved from .8% in 1950, to 2.0% in 1970, and has been projected to reach 3.7% in 1980.

There are a number of factors, already visible, which support the expansion of MIS in higher education during the next five years:

1. The increased competition for state and federal funds, especially for income subsidies.
2. Reduced political attractiveness of education.
3. Increased emphasis on cost effectiveness and accountability in every arena.
4. The hope that more information will reduce the value judgement requirement in allocation decisions.
5. Faculty and staff negotiations of wages, hours, and conditions of employment.
6. The forseeable end of enrollment growth and the inevitability of retrenchment.
7. The search for strength, reallocation, or even survival within each institution.
8. If support continues to move directly to the student, and away from direct institutional support, the intra-system, and inter-institutional competition will grow more severe.
9. The movement towards more centralized planning and control in government, formulae budgeting in education.
10. The credibility given to counting, and "numbers" reports.

The position of the academic administrator, particularly at the level of dean or department chairman, may nearly approach that of the superintendent, foreman or supervisor in the profit seeking organization in which the MIS procedures were developed. Increasingly, justifications for budgets will have to be documented, with increased costs balanced by identifiable increased benefits. And then actual expenditures that vary from planned expenditures will need to be explained. And as the communication channels between the justifier and the allocator become longer, more formalized information systems become necessary.

The decisions affecting resource allocations have value and fact components. While it perhaps is no more critical for education than any other service endeavor, MIS is primarily a fact channel. If it is given increasing reliance, then value transmission may be neglected. Educational administrators must work equally hard to find ways to transmit this more obscure message, or else we may lose out in the "numbers" competition.

The smaller institutions face an MIS cost dilema. Because of the nearness of their decision makers, they have less need for a sophisticated information systems, increasingly a part of most state systems. The MIS requirements projected for national planning are an extension of the state systems already providing information requested by state legislators and coordinating councils. For the smaller institution, therefore, the supplying of this information for national consumption will represent an increased cost, since this detail may be extra to their needs.

But along with the problems come the opportunities. MIS is a tool, and will only become a master by default. More information is required by the allocators who must make hard choices. Cost accounting never has developed a new product, an advertising campaign, or made a sale. Likewise MIS will force us to review what we are doing, ask how many really care, and otherwise shake our little worlds. But without careful monitoring, MIS can lead people to wrong conclusions about our programs. So MIS is worth considering in some detail to help develop a feel for the total implications of the "counting" that is and will be taking place with greater fervor.

WHY MIS

The classical exercise in political economy is the allocation of scarce resources. As the debate moves to successively higher organizational levels, the choice among alternates becomes more difficult because in the comparison of competing claims, there is no common denominator. How do you know if the next million dollars spent on defense, or education, or support of farm prices, will produce the greatest benefit for the United States. An approximation is to compare costs and benefits of each proposed program. MIS seeks to provide specific information about those costs, and about those benefits which will provide the decision-maker with a basis for making his choice.

While most people admit that these procedures are an approximation, and that the evaluation of benefits is particularly difficult, there remains the hope that a rational basis to assist in allocation decisions can be developed. A second objective for MIS, in addition to more information, is to encourage the greater use of management techniques in higher education. Whether or not planning, organizing, implementing, evaluation and control functions will be more readily accepted in higher education organizations because of MIS is yet to be seen. It is more probable that unique techniques, in contrast to those developed for profit-seeking organizations, will need to be developed.

Maybe MIS is a fad, and is an attempt to use massive quantities of information in lieu of leadership and judgement. Maybe it can't gain acceptance in higher education in the long run. Then it will merely divert funds in the short run, not contribute to more effective utilization of resources, nor help legislators make their difficult allocative decisions. And the success of MIS will be measured. The evaluation will be made by people on and off campus. But in the meantime, it is part of the scene, expanding, competing for resources, and requiring your assistance to give it a fair trial. And while it is being given a fair trial, you will learn a lot about your organization, maybe more than you really wanted to know.

MIS - MANAGEMENT PLUS INFORMATION PLUS SYSTEMS

Management Information Systems are being developed to attain more effective use of resources through better management, with better management resulting from more information. Information systems are therefore an adjunct to Management by Objectives and Management by Exception in which institutional objectives are translated into operating plans or programs, priorities selected on the basis of information relating costs and benefits of each program, followed by additional information to tell managers how successfully their initial objectives are being realized. The Management by Exception concept adds the dimension that the information system should be designed to produce "early warning signals" to sound the alarm when actual performance is veering away from planned performance. The manager is then able to focus on "exceptions to plans" and not be tied to shepard-ing normal, daily events. The current stress on information systems (say management softly) resulted from higher education's general resistance to the idea that it can be "managed", and the reluctance to conclude that any of its activities outside the business office, are potentials for techniques and procedures identified with professional management. With MIS, there is an implicit hope that management can enter higher education's backdoor in the shadow of information systems. The degree to which this can be accomplished, may be the measure of success of the entire MIS concept. However, if the accumulated information is not used in the decision process, it then has become another interesting academic exercise.

What are the possibilities of acceptance of these practices? MBO, Management by Exception, MIS, evolved in profit-seeking organizations where an overall profit plan is translated into unit objectives for implementation. Standards are available to estimate each cost element for a product or service, and income is projected from sales forecasts and competitive pricing policies. Each organizational unit becomes an income and cost center, each with a profit objective of its own. Parenthetically, this results from centralized planning, implementation, and control, in the profit seeking organizations, and each area is singled out for its contribution to profit. In education, centralization has appeared in state systems, and it is probable that this centralized planning and control function will be essential if comprehensive, integrated, MIS is to be implemented in

higher education. Yet the resistance to this centralization, which has been traditional posture of higher education, may limit the success of MIS. This possibility will not stop the current MIS activity, be it well or poorly implemented, for most of the governors, legislators, trustees, members of coordinating boards are aware of this approach to organizational planning and control. Each individual decision maker is seeking some quantitative measures to assist him. Higher education will have to use this system, or be prepared to develop one of its own.

The systems component of MIS stresses the interrelationship of all of the components of higher education and major systems, mini-systems and sub-systems and further suggests that there is a need to consider the overall higher education system as well as all of its parts. In support of the "overall systems concept", there should be a totally compatible information system to relate the educational activities in each state, in each state system, on each campus, and in each college and department. Further, if the system is carefully designed, it will also provide all of the internal information needed by each department chairman, dean, comptroller, and president, as well as, state coordinating boards, state finance officers, legislative staffs, and all of the other participants in this enterprise.

Figure 1 illustrates the function of an information system. The data base can be maintained manually, or more commonly it is now visualized as a computer memory. Data describing daily transactions are entered in the memory or file as inputs. Then for each report required -- grade reports, transcripts, budget reports, questionnaires -- the appropriate data is retrieved from the file. It is not necessarily, and normally not retrieved in the same form as it was entered, and may be withdrawn in combination with historical records and data from several offices.

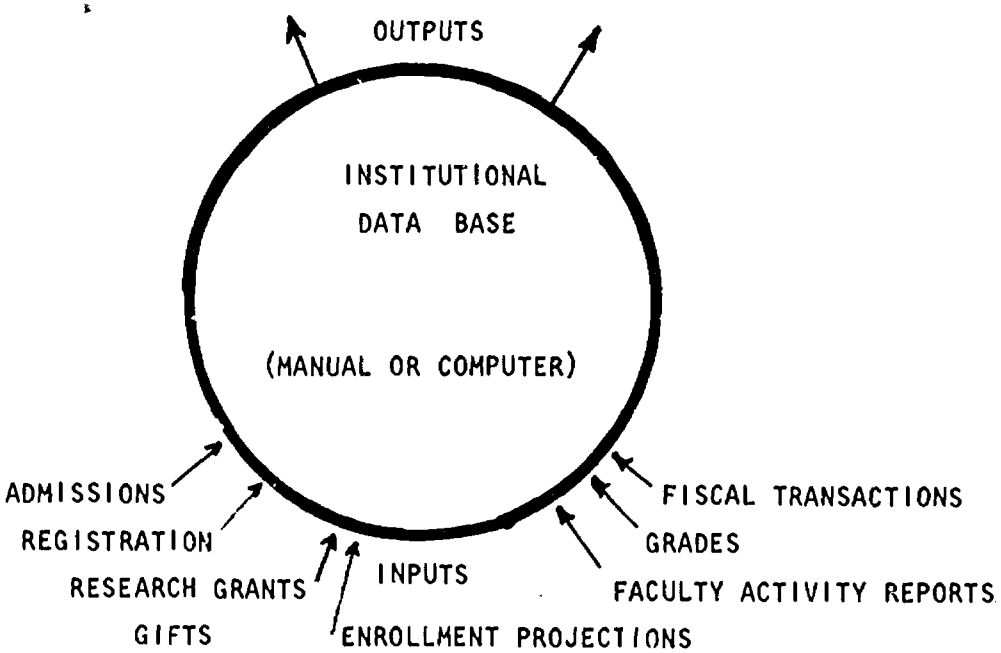
When applied to any organization, a "total" management information system accommodates all of the needs for information for both operations and management functions. The historical data is used to predict future performance, and the selected operating plan becomes the basis for control of daily operations. For example, a student file is developed

MANAGEMENT-TYPE REPORTS

FACULTY TEACHING LOADS
COST-PER-STUDENT
CASH FLOW
GRADE DISTRIBUTIONS
STUDENT RETENTION

OPERATIONS REPORTS

GRADE REPORTS
MAILING LABELS
BUDGET REPORTS
ACCOUNTS RECEIVABLES
ROOM ASSIGNMENTS



MANAGEMENT INFORMATION SYSTEMS

Figure 1

when he applies for admission. If he enrolls, his degree program requirements are entered in the file. Each grade report is entered and the courses he has completed are automatically deleted from his program of studies and moved to his transcript. At any time an audit of his uncompleted program can be produced including the final check that he has fulfilled the degree requirements. After graduation, transactions affecting his status as an alumnus are entered as long as he is alive. If this is an "on-line" system, the president or any other administrator can retrieve information about the student by teletype, hopefully even, his current address. This is a vision of a total system some institutions (Stanford, Windsor) are developing on a pilot basis.

WICHE

The interest in MIS for colleges and universities, states, and the entire country intensified with the introduction of program budgeting at the federal and state levels. MIS then gained national visibility in education through the efforts of the Western Interstate Commission for Higher Education. Their Management Information Systems Program[1] received the support of the U.S. Office of Education, and has since "gone national" to become The National Center for Higher Education Management Systems at WICHE. The stated purpose of this program is:

> To design, develop, and encourage the implementation of management information systems and data bases including common data elements in institutions and agencies of higher education that will:
>
> Provide improved information to higher education administration at all levels.
> Facilitate exchange of comparable data among institutions.
> Facilitate reporting of comparable information at the state and national levels.

[1] Compatible Management Information Systems, Technical Report No. 1, WICHE, Boulder, Colorado, May 1969.

It is difficult to know at this time how much impact this activity is having on the many campuses in the country. National statistical summaries lag by two to three years. And like the census, how would you find out if the data is poor. Much of the NCHEMS initial effort has been directed to developing data element dictionaries so that standard definitions of data elements can be used, a first step in reporting information that will be comparable from one campus to the next. With the availability of these standards, and with their adoption by state and federal agencies, it is then possible that there will ultimately be uniform reporting. But we are not there yet. Each person who classifies data must be trained in its ultimate use, including data element definitions, and standardized computational procedures. For example, how many definitions are there for a full-time-student-equivalent? Then there are always compromises in the system design between that which would ultimately be the best, and that which has a reasonable chance for immediate successful implementation. This reduces sensitivity. In addition, those states and large campuses, who have already established information systems, are reluctant to make major updating system changes in order to be compatible with a national system which itself is not yet stable. But a beginning has been made, standards are available, and as the federal government adopts these formats for its own extensive information inquiries, the national information system will slowly move towards a common language.

THE NATIONAL COMMISSION ON FINANCING OF POST-SECONDARY EDUCATION

The preliminary response by this Commission to the congressional mandate to "determine the need, the desirability, the form, and the level of additional governmental and private assistance to post-secondary education",[1] has focused on the need for more information. The preliminary report,[2] includes a number of conclusions and recommendations

[1] Jane S. Shaw, "National Policy and the Great Tuition Debate -- Does This Man Have the Solution? Maybe", College and University Business, February 1974, p. 25.

[2] Chronicle of Higher Education, January 28, 1974, p.4., and initial reactions, February 4, 1974, p.5.

that could have a major impact on MIS on all campuses, and on the "management practices" that will have to be adopted if these recommendations are accepted as a condition of increased or even sustained federal support of higher education. Some of the conclusions and recommendations most pertinent to MIS, are listed below. I have identified the function they seek to support in the parentheses.

(Comparable Information)

1. "The commission recommends that comparable financial information for the entire post-secondary education enterprise be collected and reported in a timely and systematic fashion".

(More Data)

2. "The commission recommends that data should be collected on those sectors of post-secondary education other than (in addition to) those identified herein as the collegiate and non-collegiate sectors".

(National Standards)

3. "National standard indicators should be developed to determine the relative financial status of the different types of post-secondary educational institutions. The commission report suggests a number of such indicators for consideration".

(Better Management)

4. "Institutions of post-secondary education should use financial and other resources both efficiently and effectively and employ procedures sufficient to enable those who provide the resources to determine whether those resources are achieving desired outcomes".

(Program Pricing)

5. "The programmatic interrelationships among research programs, graduate education and undergraduate education should be studied so as to understand better the induced financial effects of individual program financing decisions on an institution".

(Per-Student-Costs)

6. "The most useful unit cost data for administrators and policy makers are the direct, indirect and full annual per-student costs of instruction for each major field of study, level of instruction, and type of institution".

(Alternate Costing Methods)

7. "Federal support should be provided for the development and reporting of financial and program data to supplement and extend the cost-per-student data".

(Excellence)

8. "Although the commission is aware of a variety of efforts to support and measure excellence in post-secondary education, it finds excellence difficult to evaluate and finds no adequate measures to fully assess the level of achievement of the objective of excellence".

(A Permanent MIS Activity)

9. "The federal government should support a national center for educational information".

(Disclaimer, caveat)

10. "Cost-per-student calculations are technically possible for most instructional programs at most institutions; however, the currently available procedures do not fully reflect the complexities of those institutions that offer a combination of instruction, research and public service programs or a combination of vocational and academic programs".

These items describe the direction in which this Commission believes the federal government should move relative to MIS. The wider the search for support of higher education, the more remote are the allocation decision makers from the activities, and the greater will be the need for formal justification of requests for support, and reporting of the success of goal achievement.

COMPARABILITY IN MIS

The NCHEMS MIS program has moved through three stages, definition of terms, description of procedures, and pilot testing. It is now ready to be tested more widely. The recommendations of the National Commission on Financing of Post-secondary Education will give this activity new impetus. But during this next refinement period, the academic administrator must follow carefully those procedures in which his programs are compared to others. He should be convinced that there is a basis for comparison, and if variances exist, he should determine why.

For example: the reported cost per student in different categories of institutions is:

Table 1

Institutional Category	Minimum	Mean	Maximum
Public Universities	$ 887	$2,499	$ 4,452
Private Universities	812	4,609	10,977
Public Comprehensive Colleges	504	1,144	2,508
Private Comprehensive Colleges	674	1,434	3,505
Public Limited Comprehensive Colleges	643	1,172	2,040
Private Highly Selective Liberal Arts Colleges	988	2,393	5,460
Private Less Selective Liberal Arts Colleges	556	1,494	5,980

Source: Office of Education, HEGIS institutional data, fiscal year 1968.

It is quickly apparent that the data in Table 1 is of limited value. There isn't enough information to tell if the data describes comparable situations. This information is inadequate to adequately plan, or to evaluate and control operations.

When the NCHEMS project was initiated by WICHE, higher education was still planning unparalleled growth. New campuses ere being developed, the number of high school graduates as well as the proportion going on to college

was climbing. Planning focused on expanded needs. The sequence of calculations chosen to arrive at operating and capital costs were particularly meaningful for planning expansion:

- Enrollment projections by major
- Their anticipated enrollment in courses offered by various academic departments to satisfy the major degree requirements
- The number of faculty required to teach the projected course requirements
- The direct and indirect faculty, department and institution costs
- The cost of facilities to accommodate courses, faculty and the supporting activities

Then an index was created (cost-per-student) so that with a knowledge of anticipated enrollments by major, the total costs of a campus or the national enterprise could be calculated. But after an acceptable plan is implemented, and the analysis of cost effectiveness begins, the cost-per-student loses its value as a yardstick to evaluate performance. The comparison is really only valid if the unit being evaluated enrolls the same number of students as the average size of all of the units who contributed to the development of the statistic. Units with larger enrollments will appear "more profitable" because their costs are absorbed by a greater number of students. The units with smaller than average enrollments, will appear to be inefficient even though the enrollment level is rarely within the control of the administrator of the unit being evaluated. This will be discussed at greater length in the section on enrollment levels. The cost-per-student may be a fine planning statistic with aggregated national data, but it is inadequate for the management functions of planning, implementation, evaluation or control at the campus or college level. The cost-per-student is influenced by several factors including:

- The number of programs (majors or disciplines, and degree levels) offered
- The enrollment by programs
- The average salary of faculty
- The clerical assistance ratios

The average clerical salaries
The other department expenses per faculty member
The institutional overhead expense per program

With comparisons using these eight values, it is still possible to calculate cost-per-student, and also to identify the reasons for any disparity when interinstitutional comparisons are made among programs.

The Commission on Financing Post-secondary Education recognizes that the cost-per-student procedure is primarily a useful tool for institutional comparisons and state and federal policy. It has suggested:

1. The standards may not accurately represent institutions with a high level of non-classroom activities or vocational education
2. The data's degree of accuracy may have been reduced in order to simplify the procedures for collection.
3. The marginal-costs of adding or subtracting students may be more useful than annual average per-student costs.[1]

AN ALTERNATE TO COST PER STUDENT STANDARDS

It is easiest to collect per-student costs. Total costs can be divided by total enrollment at the department, campus, state or national level, and have a validity for planning. The validity, of course, diminishes as the planning moves down the heirarchy. And if management controls are applied at the department level using the gross values of national data, they will be misleading. Following the leadership of the profit seeking organization, standards should be developed which are useful at the department level, retain their validity as they are aggregated at the college, campus, state, and national level; combined into national, state and campus plans, and then implemented along with cost effectiveness measures based on the variation from the plan. To do this, it is necessary that costs be developed by programs, distinct from enrollment considerations, and to compare programs as basic units, not students as basic units. Table 2 begins an illustration of the situation.

[1]A Staff Report by James Farmer, "A Proposal: Interim National Standard Procedures for Deriving Per-Student Costs in Post-secondary Educational Institutions:, National Commission on the Financing of Post-secondary Education, December 31, 1973, p. 7.

ENROLLMENT AND UNIT COSTS

Table 2 lists the credit hours generated by selected undergraduate departments at Santa Clara. With business, engineering, humanities, and science schools, these departments have courses for their own department majors as well as service courses for other majors. It is interesting to note the general pattern of enrollment (with noticeable exceptions because of service loads) and the distribution of B.S. degrees awarded nationally. Unless an institution has a unique specialty, most institutions will attract a cross section of current student interest.

An alternate method of planning for, and controlling costs of departments is proposed in a later section. It accommodates enrollment as a policy decision. Briefly this procedure suggests:

1. That during the planning process, very little time should be spent on a statement of broad general institutional objectives unless it is needed as a preface for the catalog.
2. There are 478 academic disciplines in which programs can be conducted at up to four levels -- lower and upper division, masters, and beyond. Which of these programs are to be undertaken by an institution is a basic policy decision that has a major impact on its costs.
3. The enrollment in each can be predicted from national interest trends. The costs of each can be projected by selection of critical program characteristics.
4. Starting with a small academic core, each subsequent planning decision becomes a marginal cost decision until a model any size can be developed.
5. National MIS programs could contribute to identifying standard cost goals, and what each represents in implied benefits.
6. Deviations between a planned, standard cost program for an institution, and its real-life, existing programs, become specific operating constraints around which new operating strategies and policies can be developed.

But first, more about the present scheme.

Table 2

Credit hour enrollment* by Department at Santa Clara and degrees granted in the United States.

Department	Santa Clara Credit Hours 70-71	B.S. Degrees in United States 70-71	Santa Clara Rank	U.S. Rank
English	16,682	51,649	1	1
History	13,065	44,931	2	2
Economics	11,207	15,958	3	8
Sociology	10,850	33,662	4	4
Mathematics	9,398	24,366	5	6
Accounting	7,141	22,367	6	7
Psychology	5,724	37,493	7	3
Biology	4,896	26,531	8	5
Chemistry	4,778	11,157	9	9
Classics	463	563	10	10

*Credit hours earned in the course multiplied by enrollment

Table 3 carries this enrollment-cost relationship the next step. Here the departments (Column 1) are ranked in order of their cost per credit hour. (Column 3) It can be seen that those with largest course enrollments (Column 2) tend to have lowest per credit hour (or per student) costs. There is no immediate evidence (based on per student cost) that history is twice as cost effective as biology. With twice as much enrollment, it has more students available for its courses. And that is good. But biology isn't automatically bad.

Table 3

(1)	(2) Cr. Hr.	(3) Cost Cr. Hr.	(4) Courses Offered	(5) Sections Offered	(6) Cost Per Section	(7) Cr. Hrs. Per Section
Sociology	10,850	9.7	40.1	57	$ 1,847	190
History	13,065	12.8	84	103	1,620	127
Economics	11,207	14.5	37	70	2,331	160
Psychology	5,724	14.8	25	42	2,001	136
English	16,682	16.3	70	172	1,581	97
Accounting	7,141	17.7	18	42	3.022	170
Mathematics	9,398	18.2	39	90	1,897	104
Chemistry	4,778	23.1	31	32	3,507	149
Biology	4,896	24.3	27	31	3,895	158
Classics	463	49.2	18	19	1,200	24

If the cost effectiveness of the department is to be appraised, additional questions must be asked:

1. How many courses does it offer anually?
2. Is this number commensurate with their major program and service requests?
3. What are the teaching loads?
4. Are the support services of the unit consistent?
5. How was the section size policy developed?
6. Are salaries a department decision?

If a comparison is to be made with departments in other institutions, (of like size and service requirements), and these are to become "operational goals", the controllable factors must be identified.

Much more subtle questions remain. Should a department reduce its teaching loads by offering a limited number of very large lecture sections? If student-faculty interaction is considered good, should it be required through course scheduling constraints?

What is the value of a class of 35 over 100 or is it an attempt to limit assignments and examinations to be graded?

In summary, cost per student values can be incorrectly applied. They are truly comparative when used at the same enrollment level for which they were calculated, for similar programs. When challenging average costs of a department, the enrollment should be considered as a seperate parameter. The program with low enrollment may be expendable when things get tight, but the faculty should not have to teach twice as much in order to achieve comparable costs-per-student.

But not all the MIS concern should be with academic departments just because they are neat packages, for it often represents only 50% of an institution's expense.

USE OF ACADEMIC PROGRAMS AS COST CENTERS

The academic administrator should be sensitive to the implications of using academic programs as cost centers, and then the development of cost per student data by level. This is the adoption of the profit-seeking organization's procedures. Profit centers are a logical step in establishing a product sales price, or to identify where costs are excessive when a competitive sales price is used. This is not an illogical approach if tuition charges are related to program costs. (See Myron H. Ross, "Let's End the Free Lunch and Start Full-Cost Pricing", College and University Business, February 1974, p. 30). But in the meantime, through the allocation process, academic departments, and in particular faculty salary and activity loads, receive major scrutiny, while the allocated costs go unchallenged. A typical example:

Table 4

Expenditures for a College (000 omitted)

		% of Total	1972 to 73 Change
Instruction	$3,450	44	- $ 175,000
Library	208	3	+ 13,000
Operation of Physical Plant	828	11	+ 57,000
Administration	1,020	13	+ 38,000
Staff Benefits	716	9	+ 27,500
General Institutional	115	2	+ 8,800
Student Aid Expense - net	612	8	+ 106,000
Intercollegiate Athletics - net	182	2	+ 6,000
Debt Service	570	8	+ 6,000
	$7,651	100%	

In this institution the impact of enrollment changes, and the budget adjustment has this effect on per-student-costs:

	1972	1973	% Change
Instruction	$1,390	$1,422	+ 2.3%
All other expense	1,510	1,731	+15 %
Total	$2,900	$3,153	

The administrator responsible for a college or department must be aware that he is competing for support with all the other programs on campus, and many have not experienced the economics of scale which are inherent to the growth of the profit seeking organizations. One of the fundamentals of industrialization is to expand production so that overhead can be absorbed by a great number of production items, and increase the profit on each. Since the costs of higher education have quadrupled while enrollment doubled, overhead may have gone up faster than instruction, research, and public service. But cost-per-student doesn't lend itself to analysis of this problem.

There is little published information about this aspect of university accounting since the allocation approach often buries this information. Table 5 is a record of the computer center expense at Santa Clara. There is no way of knowing if this is typical. Many of these costs were justified by MIS, more data, better data, and more quickly produced, with which to make better decisions. There is no question that as things get tighter, there will be a closer look at what better decisions are being made.

Table 5

History of Computer Center Expense, University of Santa Clara

Year	Enrollment	Center Expense	Cost-per-Student
1963	3312	$ 30,800	$ 9.30
1964	3715	36,200	9.75
1965	4164	51,000	12.25
1966	4390	77,250	17.50
1967	4995	122,600	25.00
1968	5282	179,500	33.50
1969	5592	258,000	46.50
1970	5893	307,800	52.50
1971	6085	295,500	48.50
1972	6075	300,000	49.30

Every non-instructional expense should be subjected to the economy of scale test before it is allocated to the primary programs as overhead.

For example, the unit costs of the instructional programs in Table 2, with the exception of the Classics (on which much less is spent by far than the copying machines sprinkled across campus) are well below the comparable credit hour income of $42. Academic departments become a fiscal burden only after overhead is allocated.

THE COST OF MIS

The vote on whether or not campus Management Information Systems are cost efficient has not yet been tabulated. It is possible to review the history of the clerical expenses in the areas of administration where computer processing has been introduced. Direct savings on clerical costs can be identified where they occurred. If MIS is producing better decisions, they will need to be identified. While we may know more about our institutions, we see no evidence of greater student satisfaction with higher education as the percent of high school graduates who continue on, declines. Some of the institutions who are highly dependent on gift programs, have been able to use information systems to increase donor participation. Still to be carefully considered, is the concept of decentralization of data processing and the use of more specialized mini-computers in "dedicated" service, rather than tying up expensive equipment to accommodate simple processing needs. This would effect integrated MIS. As each institution reviews its priorities for the n^{th} time, MIS will be screened, and that is when the vote will be counted.

COSTS AND BENEFITS

MIS is a two-way street. For planning and allocation, there is need for information to help determine the share-of-the-pie. Dollars invested in Program A will produce what benefits in relation to the costs and benefits of Program B. Once the pie has been eaten, there is a question of performance and effectiveness as evidence to use at the next pie cutting.

While most information systems are excellent for accumulating costs, good at accumulating outputs (credit hour enrollments, degrees granted), they are poor or totally neglectful of benefits. And it is primarily because benefits are so difficult to measure. John Keller[1] proposed fourteen "proxy measures" of the benefits of the instructional program:

1. First offered wage
2. Cumulative income (over 5, 10, 15 years)
3. Proportion into management level (by fifth or tenty year)
4. Number of papers published in scholarly or technical journals
5. Rate of election to select professional groups or posts
6. Proportion teaching in select schools
7. Rate of award of civic and professional honors
8. Proportion holding governmental posts of significant responsibility
9. Proportion holding elective office
10. Voting frequency
11. Rate of participation in local civic affairs (fund drive chairmanship, Boy Scout leadership posts, etc.)
12. Drunkenness, arrest, and divorce rates
13. Book and magazine reading frequency
14. Personal evaluations of intellectual and social satisfaction

These measure the benefits (of positive and negative behavior) that might accrue to an individual as a result of his education. Much work will have to be done before these or other measures of benefits are practical. But the time is passing when it is possible to claim that our activities are not subject to measure. If they are not, we may not be competitive in the funding arena.

For the academic administrator, this is a reminder that the value component of the allocation decision is closely related to these difficult to quantify benefits. We do very well with costs and outputs.

[1]John Keller, "Higher Education Objectives: Measures of Performance and Effectiveness", Management Information Systems, Their Development and Use In Administration of Higher Education, ACE-WICHE 1969, p. 81.

And this is the point where the theoretical basis for MIS as a supporter of decisions runs into practical problems. When the problem lends itself to counting, where mathematical analysis is helpful, "one calculation is worth a hundred hunches".

But the value component of the decision is high in education. And this is the arena in which higher education must spend more time -- the description of our case, the benefits of education.

The discussion this far has been critical of the manner in which MIS is being applied in higher education. The balance of these comments will be directed towards procedures which can accomplish the same ends, be of greater use at the campus level, and cost less to implement.

PLANNING - PRIMARY PROGRAMS - A PROPOSAL

Some of the previous criticisms of the use of MIS will be difficult to overcome. The communication of benefits, rather than outputs, is one. Another is the inevitability of aggregated data being used to describe imaginary average situations. But alternates to cost-per-student and a greater concern for economies of scale in overhead, are not only possible, but essential for developing models of viable institutions operating under no-growth conditions. The sections that follow describe a planning sequence in which a basic, minimum program for an institution becomes a planning core. Then this basic model is expanded towards the ideal by making a series of decisions about marginal expenditures. This is essentially a variation on the zero-budget concept, with greater emphasis placed on the policy decision points. In addition, rather than "decision packages" being presented to higher administrative levels for approval, the plan is evolved by a central group sensitive to the objectives of the overall institution, as well as the competitive needs of the various programs.

Beginning with the WICHE program structure shown in Figure 2, the initial planning decision that must be made by every institution is the variety and level of instruction programs in which it wishes to

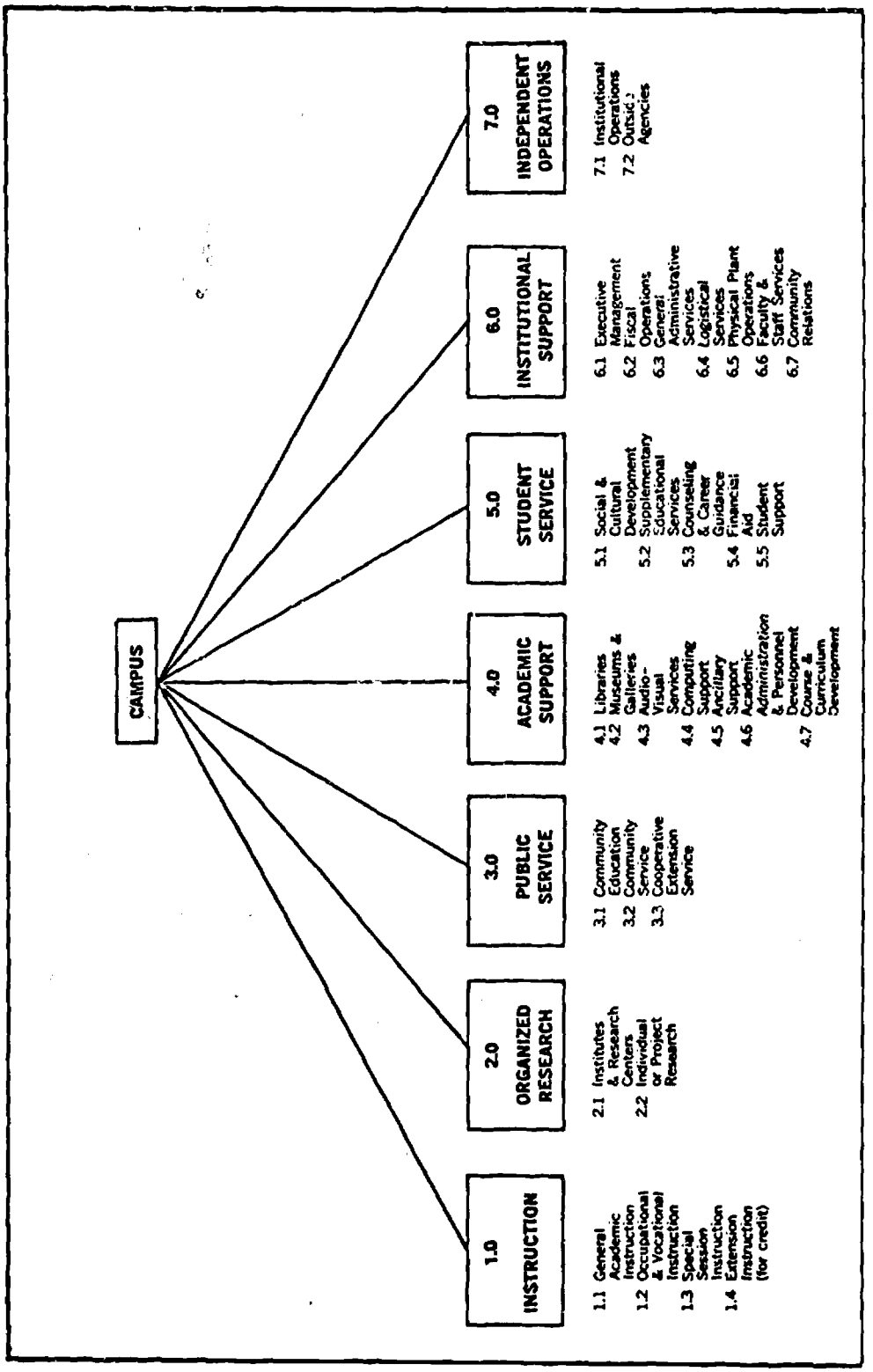


Figure 2: NCHEMS Program Classification Structure

engage. The Office of Education, Higher Education General Information Survey Taxonomy, lists 478 disciplines offered in four year institutions. Instruction can be offered in each one of these at the lower division, upper division, masters and doctoral level. With 478 disciplines and four levels of instruction 1912 possible combinations of discipline and levels could theoretically be offered by an institution. The initial central planning decision, therefore, is how many of these programs to offer, for this defines the character, complexity, relative size and the ultimate costs of the institution.

The reason for starting with a "basic core" is to in effect wipe-the slate-clean for planning purposes so the synthesization of an ideal program will not be clouded by the current scene -- the core allows an attack on the status quo.

It is considered preferable to go through the listing of desired programs simultaneously with establishing institutional objects. Policy or strategy decisions about discipline programs might include:

1. Lower division, upper division, master's and doctoral levels. One or more, or all, is a significant focusing of objectives.
2. Offer the programs with the greatest potential for enrollment. Based on degrees granted in 1971 these would be:
   - Elementary Education
   - Business
   - English
   - History
   - Psychology
   - Sociology
   - Political Science
   - Biology
   - Physical Education
   - Mathematics
3. Another basis for selecting majors: which would cost the least to offer. The list in paragraph 2, minus biology would probably serve.

4. The programs traditionally found in a liberal arts college probably needs refinement for the seventies. For example, what variety of foreign languages should be available. How many programs should culminate in a major.

It should be remembered that in this planning stage, this is the development of a list of the sequence in which academic programs would be undertaken under ideal conditions, including the appropriate level. While the cut-off-point on the list will ultimately be determined by economics, at this point it is a priority listing considering costs and benefits. The cut-off-point may shift with future events, or even as more information becomes available in the planning stage.

The information required at this point is not great, national enrollments by discipline and levels, and some idea of how the institution relates to national interest patterns.

The decisions concerning instructional programs will have the greatest impact on most institutions. The other two primary programs, research and public service lend themselves to more spcific decisions, program by program.

RESEARCH AND PUBLIC SERVICE

There must be a clear distinction between department and sponsored research in MIS summaries. Department research has two components which relate to planning as well as control.

1. One component of department research is the "search for knowledge" which represents the time a faculty man spends in expanding knowledge in his field. In faculty activity analysis, it may well be the numerical difference between student contact hours and some imaginary faculty work week.
2. A second component of department research is the "instruction-research" activity identified with graduate study, and whose time demand is rarely adequately recorded in thesis hours or independent study.

3. Sponsored research has a significantly different impact on operating budgets because it not only does not represent faculty effort in competition with instruction and department research (academic department budgets), but often provides additional marginal income to the institution, as well as lending partial support to department activities.

Most current MIS reporting often does not distinguish the difference among the sources of support for research -- tuition, state or gift funds, industry, or the federal government. Yet in the operating of a school or department these are often critical.

Public service programs parallel the research program impact. If they are supported from internal funds they are in direct competition with all of the other programs in the institution. If they are self-supporting, bring in additional funds to the institution (which would not be available without the activity) then they have a marginal impact whose impact requires very sophisticated MIS. The list of instructional, research and public service programs in which an institution would like to engage, and their anticipated activity level shapes the major profile of an inatitution. How these programs are carried out -- the potential "quality of instruction" then introduces a series of decisions which are not enrollment dependent. If a planning decision has been made to offer a master's degree in program X, then there will be personnel requirements, and support requirement quite independent of the enrollment in program X up to the point (another policy decision, not MIS supported) where duplicate (more sections) opportunities are required. At some point, in even the largest institution, the next program can be anticipated as enrolling a maximum of two people. This is, of course, taught at no cost if independent study is given no faculty teaching load credit.

PERSONNEL STAFFING CRITERIA AND PLANNING

It is doubtful if the first proposed list of instruction, discipline-level programs will be the final profile of the institution until available resources and projected costs are compared. The translation of programs

into faculty requires policies on staffing criteria, such as those illustrated in Table 6. This kind of instructional model testing is discussed in great detail by Bowen and Douglass[1].

Table 6

A Small College Faculty Staffing Plan

Class	Enrollment	Courses Required	Courses Offered	Faculty Load	Required Faculty
Freshmen	60	12	24	12	2
Sophomore	60	12	24	12	2
Juniors	30	12	20	12	1.6
Seniors	30	12	20	12	1.6
	180			Total	7.2

For personnel planning, the staffing criteria to be established include:

The number of courses or credit, required for graduation
Section size (minimum and maximum)
Elective course opportunity
Faculty teaching loads.

Normally upper division sections, particularly those in the major requirement, will have the smallest enrollments. The disciplines with sections that exceed the section size range offer no problem. Those whose "share of the market" is below minimum section size move into a marginal position competing with all other activities who are the next to be added (or subtracted) as the planning model is expanded from the core.

And the plan is not just a sequential reconstruction of the existing organization. It is the development of a new plan to get where you would like to be right now, and next year and the year after. So it will include new

[1]Howard R. Bowen and Gordon K. Douglass, "Efficiency in Liberal Education", McGraw-Hill, 1971.

programs -- even knowing that their funding will further stress an impossible situation -- forcing competition of new and old programs. While a viable institution of the size described in Table 7 may not be possible, history may prove that with no-growth, size is a handicap. This planning mode, therefore, is to restructure the institution from a basic core, identifying and recording each proposed incremental benefit and incremental cost. If in the future it is necessary to back-off, to consider a less grande strategy, the incremental costs and benefits are visible. In the meantime, they can be used for "the case" for the development office.

SUPPORT PROGRAM GOALS AND PLANNING

Added to the WICHE primary programs of instruction, research and public service, are the support programs: academic support, student service, institutional support and independent operations. If the MIS concept of the profit seeking organization is pursued, these are overhead, with the primary programs as "direct costs".

How do we plan for support. First, consider the college described in Table 6 with 180 students, and perhaps five to eight faculty. It is possible to imagine a chairman-business manager, secretary and custodian in the support functions. As the "paper model" grows with the addition primary programs in instruction, research and public service, a comparable expansion of support programs will take place. One of the eventual outputs of a national MIS activity should be the accumulation of support costs by activity levels. What is the clerical support level range for admissions, records, purchasing -- by enrollment levels, or by some other more pertinent measure of activity. Student-faculty ratios have been discussed for years. Similar measures should be visible for the other areas. In the meantime, "standards" can be developed from each institution's historical records. What was the rate of increase in support programs during growth periods. With suitable review, these can be reconstructed to provide "goals" for planning. It is possible to develop schedules for each of the program elements described in the WICHE classification system similar to Table 5 - History of Computer

Expense. A schedule should be made comparing enrollment levels and each of the support program expense levels. Then a number of points should be raised before planning goals are set.

1. What is the purpose of the exercise? It is to establish workable planning goals which are reasonable if the organization must retreat to lower enrollment levels and adjust to reduced income (tuition or state assistance).
2. If a practical enrollment level-expense level is not selected, and the total institutional expense level is too high, it will only be necessary to review all goals for a second time and readjust them. It is much easier to add "selective enrichment" if planning goals are too modest.
3. Most historical higher education allocations were not critically reviewed. During the growth periods everyone got a little more (that's why economies of scale weren't experienced) on the assumption that a balance would ultimately be achieved probably through the "loudest squeak-grease" phenomena.
4. Institutions of Higher Education tend to spend all the resources that are made available to them. Therefore in the past ten to twenty years someone grabbed the funds. Now the question is, who were they, and in the clinical light of history, was it reasonable?
5. Needs of institutions change. What were the reasons for an activity level and do they still exist? This is the ideal time for Monday morning quarter-backing.
6. It is difficult to review history without considering the possible problems of modifying current operations. At this stage thoughts of implementation should be deferred to deliberately isolate the functions of planning and implementation.

One of the most difficult support areas to reivew is library expenditures. Few of us have missed the frustration of looking for a book or article which isn't in the collection (or is at the bindery - a different problem). Yet there has to be a limit to the percentage of the

gross national product spent to approximate the Library of Congress on 2900 campuses. And this is, of course, the range within which a goal must be selected. Rather specific policy decisions must be made to help narrow the search:

1. How important is the library as a giant study hall, with enough tables, chairs, and supervision to serve that purpose?
2. What are the specific allocation goals? Just "more", some percentage of all books being published, or competition with other libraries of like size institutions.
3. Will the library have the same goals for the next 20 years as it had for the past?
4. Is it reasonable to use support program allocation goals of say 5% of the operating budget, which automatically eliminates economies of scale, or is it possible to consider the situation described in Table 7?

Table 7

Library Appropriations With Economies-of-Scale

Year	Amount	Enrollment	Allocation per Student
1960	$ 500,000	2500	$200
1970	$ 750,000	5000	$130
1975	$ 520,000	4000	$130

5. And what about inflation in the Table 7 data? If the same historical dollars are used in developing planning goals, for all programs, the impact of inflation on each program can be delayed until the point where planning and reality are compared. If retrenchment is necessary, then inflation will have to be absorbed by consolidation of activities. There are no extra resources set aside to accommodate inflation.

It should be remembered that if retrenchment is necessary, if only to abosrb inflation, and some allocations must be reduced, this is not necessarily a

direct reduction of services to students. Most additions during growth were of "decreasing marginal utility" -- more pressing needs were satisfied at an earlier, leaner time. "Last in" shouldn't necessarily be "first out" -- but it isn't a bad place to begin looking.

To summarize these sections on planning, the purpose of this fundamental exercise of developing objectives, programs, goals, a plan, and identifying the policy choices in the process, is to identify the building blocks (program and subsequent program enrichment increments), and the sequence in which they would be added to arrive at a viable institution. This is the plan. Then the next step is to look at the current scene, match planned programs with actual programs, and develop a strategy for accommodating variations. What has all of this to do with MIS? These steps require the series of decisions which Management Information Systems are supposed to support. It is my conclusion that this kind of essential planning activity has not been delayed for lack of information, but rather there were not sufficient pressures to undertake what is essentially a negative and unpleasant task. No-growth and inflation are only two of the factors beyond the control of the campus which will make planning for viability, inevitable.

IMPLEMENTATION, MIS AND THE POTENTIAL FOR MANAGEMENT ON CAMPUS

The development of a plan which accommodates no-growth or retrenchment can become a very negative exercise particularly if it is a fight for individual rather than institutional viability. The optimistic would hopefully look for opportunities while developing a no-growth posture, perhaps by seeking an acceptable size configuration, then optimizing services rather than concentrating on expansion. Education won't be alone in this search. For zero-population growth, the depletion of natural resources, and the concern with infringement on the environment is forcing our whole economy to look at an alternate model where "not to grow" doesn't mean automatically to die.

To implement this process means that we find an acceptable way to relinquish planning control to a central group who have adequate inputs. Then perhaps formal hearing mechanisms are developed to accommodate those who

feel that their position has not received adequate consideration. The alternate to developing a method of accommodation, however difficult, is to become rigid, to slowly lose vitality, to present a disinterested or fragmented position, and then to lack the unity and strength to favorably compete for social support. Not a very pleasant alternate.

On campus, the accommodation to no growth will have a different impact at different administrative levels. For the president it is a concern for the campus as a whole and its position in the larger competition. The competititon now focuses on a relatively fixed quantity of both people and their gift or tax dollar. At this level, no amount of information can substitute for a viable mission which is compatible with contemporary social desires (contrasted with perceived social needs) and also captures the imagination of the clientele.

Within the institution, the implementation of information systems to support management functions means a comparison of the ideal plan that has been created, with the realities of the current scene. This is followed by a listing of the priorities with which identified variations can be accommodated. There are short and long run effects.

1. Schools that are losing enrollment may be adjusting to an over-expansion that occurred at the end of the sixties because facility expansion lagged enrollment growth. Now the facilities are built, and there is a withdrawal to some new level.
2. Realistic planning will seek to anticipate what that level will be, what programs are appropriate for that size, and how a stable and vital institution can be maintained.
3. The kinds of information required for effective management will change from those collected during growth periods. This will be discussed in the section on control.

It is not the purpose of this paper to dwell on the political processes within the institution. There are many studies of college and university

governance. This arena too may change when the impact of no-growth is fully appreciated. Individual participants -- faculty, administrators and students are caught between the needs of the institution to remain competitive, and the needs of the individual to survive. There are, and will be, a variety of attempts to resolve this impasse, and their exact nature will probably depend on the size, current state, and personalities of the people involved. This discussion assumes, and is hopeful, that there will be some rationale approach to arriving at a new, compromise position.

If the search for this position becomes totally political, then MIS will change in nature and certainly in application. It appears that if central government is asked to resolve the problems of allocation that cannot be resolved locally, then strong precise central planning will inevitably follow, and the ability of individual units to respond to changing needs will be sacrificed to aggregated data. It needn't happen if faculty and administrators can find preferred ways to develop MIS that will satisfy normal standards of accountability.

CONTROL OF OPERATIONS

In the classical concept of management functions, a plan is developed (profit plan or perhaps we should call it a vitality plan, for education), implemented, and then actual operations monitored to detect variations between on-going operations and the plan. This is slightly different than the deviations discussed in the previous sections on implementation of an ideal plan. At the plan implementation stage, a deviation may be a program which the institution can no longer afford and must be phased-out. The priorities and phase-out timing are part of the implementation strategy.

The control to be exercised on operations, will include cash flow -- paying bills all summer when tuition isn't collected until September, comparable wage rates, delinquent accounts receivable, gift program progress, and the other kinds of operating controls found in most business enterprises. Depending upon the size of the organization, Management Information Systems of various degrees of sophistication can be used -- based on their own

economic justification.

The much more subtle control -- the measurement of changes in quality, vitality, rate of innovation, student satisfaction -- and then the corrective action to regain direction, is not compatible with contemporary MIS. The reason is similar to contrasting benefits and outputs. Measures of quality and vitality are more difficult to quantify for adaption to computer based MIS -- they involve value judgements. But their evaluation will improve if MIS proves to be the necessary communications mechanism in an increasingly complex society.

The ultimate interest in MIS for most deans and department chairmen is to compare the costs of their units with similar activities in other insittutions. I have been critical of the cost-per-student approach to meeting this need. An alternate is the preparation of non-enrollment dependent standard costs. In any academic unit there are a number of characteristics that will affect department costs:

A. Level of instruction provided:
   - Lower division
   - Upper division
   - Master's
   - Doctorate

B. Instructional cost variables:
   - Level of faculty compensation
   - Teaching loads
   - Undergraduate and graduate student support
   - Non-academic salaries
   - Equipment expense
   - Travel and other expense
   - Physical facility costs

A STANDARD INSTRUCTIONAL-UNIT COST

A standard instructional-unit costing method, and the values that might be appropriate for a three-man academic unit (minimum department size

perhaps) would include:

Nine month compensation	
Associate rank professor	$16,000
Teaching load	12 semester hours
Class size	25 students
Support salaries	$1,600/faculty member
Support expense	$1,600/faculty member

This professor can accommodate 25 students each year and 25 students can acquire from that professor credit hour needs equivalent to (24/30) or 80% of the normal progress of an undergraduate in a year. One and one-quarter of these teaching units, at a total cost of $24,000 can accommodate 25 students per year. Five units handling a four year program can accommodate a total of 100 students at a cost of $120,000.

The values can be selected as a matter of policy, or in the future will probably be subject to collective bargaining. Starting with whatever values are selected as "standard", then each instructional unit can be compared considering the possible variables that will be encountered which contribute to different instructional unit costs.

For example, a four man department, with one assistant, one associate and two professors teach a total of 39 semester hours, to sections averaging 28 students, with support costs of $16,000.

	Standard	Actual	Ratio Std. to Actual
Faculty compensation	$64,000	$72,000	1.125
Teaching loads	48	39	.813
Average class size	25	28	1.120
Support	$12,800	$16,000	1.250

In the context of "management", the standard data is essential for any meaningful planning, and the testing of alternate strategies. Then the comparison of standard and actual can be helpful in deciding how to

modify daily operations with a minimum of negative consequence for the academic program. A decision on the rank at which a new position can be filled becomes an integral part of the planning for the entire program. With the variation between standard and actual identified, and their causes, it is possible to select alternate strategies, review policy decisions, or identify acceptable trade-offs of under or over achievement of individual instructional units. Unlike the cost-per-student index, standard costs tell where and why.

Similar standards for non-instructional units may be more difficult to determine, but the simple plotting of expense against some "volume" reference point -- enrollment perhaps, can provide a reasonable basis for planning, implementation and control -- the initial reasons for undertaking MIS.

There are many who may feel that it is unfortunate that we cannot get on with the business of education and not spend our time on formulae budgeting, standard costs, and realization or achievement reports. Yet there appears to be no other way to provide some measure of accountability, or at least show concern, to those who wish to know how funds are being spent. Remember there are a lot of competitors for those funds, and the others may find accountability techniques acceptable -- especially if that is a necessary step in gaining financial support.

LEADERSHIP AND MIS

Before summarizing these observations, a comment about what MIS is not. It is not enthusiasm, it is not personal interest, it is not innovation, it is not creativity, and it does not provide leadership for those who seek to provide these qualities in education. And this could become a negative consequence of MIS -- the assumption that with everything "nailed down" there is no need for, or worse yet no opportunity for, change, and accommodation to new needs. If this were to occur, MIS would close the very avenues it seeks to open.

But the danger of this occurring cannot become the excuse for impeding adoption of an appropriate level of MIS. Those who are spending for higher education, have a right to know what they are getting for their

money. Selfishly for education, in the competition for funds, this information will have to be provided if we want our "fair share". Difficult as they may be to provide, the economic and social benefits of education must be made more visible. In the competition among social programs, increased accountability is inevitable and will grow more intense in a no-growth environment. Academic administrators must develop adequate management information systems to accommodate planning and accountability but without overkill -- systems that in themselves become serious competitors for the resources they seek to justify. And faculty must participate in and contribute to their development to assure that value judgements aren't inundated by computer printouts.

SUMMARY

1. In support of postsecondary education, $5.9 billion comes from student tuition, $9.3 billion from state and local governments, $8.1 billion from federal sources, $2.7 billion from gifts and endowments, and $3.5 billion from institutional earnings. The various spenders increasingly demand to know what they are getting for their money.
2. During the past twenty years, enrollment has doubled while costs have quadrupled. Higher education has said that these costs would be far overshadowed by the benefits that would flow in both economic and social terms. It would be helpful if these benefits could be enumerated.
3. Conditions of no-growth in education, which may extend to other areas of the economy will intensify the competition for available resources.
4. This competition will encourage the development of Management Information Systems to help establish cost-benefits as a basis for determining the share-of-the-pie, and to provide institutional accountability.
5. The recommendations of the National Commission on the Financing of Higher Education suggest the direction MIS will take: more comparable information, national standard indicators, accountability, per-student-costs, and a national center for educational information.
6. If applied indiscriminately, per-student-costs can be a misleading indicator, for in most institutions they are enrollment dependent. Standard cost for schedules, staffing, salary, and support costs must be substituted for per-student-costs if the information is to have validity at the campus level.
7. Even if an institution is not losing enrollment, it may have to retrench just to accommodate inflation. MIS is needed to supply the information for that planning:
    a. A minimum, fundamental, academic core is proposed as the starting point to evade status quo reviews.
    b. Considering objectives and strategy, primary and support programs are then added to the planning

core with a record of the marginal costs and proposed benefits for each added program as program incremental enrichment.

c. This "ideal" plan is then compared to reality and a priority given to adjustment of variations between them. The timing of these adjustments will depend upon each institution's particular situation.

d. There should be economies-of-scale sought for the non-instructional costs even though they were not realized during the growth period.

8. The faculty must participate in the development of viable plans, and the information on which the plans are based. Without involvement they will have little input. Administrators must be involved for the same reasons, plus the need for leadership. Cost accounting, even if it is the product of a sophisticated computer system, will not provide the enthusiasm, innovation, personal concern, and awareness which is what education is all about. It is then our role to be certain that our own institutions are providing the same qualities, and that we too have not become overly emeshed in the numbers game.