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ABSTRACT

This paper outlines several considerations relating to the preparation of information systems for educational managers. College and university managers must have clearly stated needs for planning and management information and the potential uses to which such information could be put. Information systems should be created to satisfy operational reporting demands placed on the institution as well as to provide knowledge of the institution to support rational decision-making. Specific suggestions include that the managerial strengths and shortcomings of institutional decision-makers be identified before the information systems are developed and implemented; the difference between operational and managerial uses of information systems must be identified; and the uses of decision information must be identified. Challenges to the system developer to better understand the information needs of the institutional decision-makers include becoming familiar with the decision-making styles of the institutional managers; helping initiate changes in operational reporting systems to enhance their utility in providing management information; and recognizing that integrating management information considerations with the needs for operational reporting systems is an inevitable compromise that causes the data system to be less than perfect for some of its users. (JMF)

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UNDERSTANDING THE INFORMATION NEEDS OF COLLEGE AND UNIVERSITY DECISION MAKERS: CHALLENGES TO SYSTEMS DEVELOPERS

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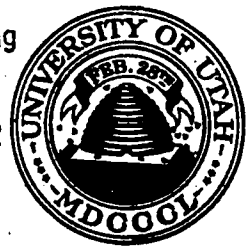

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Understanding The Information Needs Of College And University Decision Makers: Challenges To Systems Developers

Introduction

This paper outlines several considerations relating to the preparation of information systems for educational managers. Although much has been written and said about such systems, both in the past and during this meeting, there has been an over emphasis on keeping pace with the state of the art in the technical and automated aspects of these systems while little mention has been made of their utility for planning, organizing, controlling and evaluating. This observation, coupled with what I perceive to be shortcomings in the development of information systems, prompted this paper on the topic: understanding the information needs of college and university decision makers.

To set the tone for the following remarks, I wish to recall Robert F. Mager's story of the Sea Horse.

> Once upon a time, a Sea Horse gathered up his seven pieces of eight and cantered out to find his fortune. Before he had traveled very far he met an Eel, who said, "Psst. Hey, bud. Where 'ya goin'?"
>
> "I'm going out to find my fortune," replied the Sea Horse, proudly.
>
> "You're in luck," said the Eel. "For four pieces of eight you can have this speedy flipper, and then you'll be able to get there a lot faster."
>
> "Gee, that's swell," said the Sea Horse, and paid the money and put on the flipper and slithered off at twice the speed. Soon he came upon a Sponge, who said, "Psst. Hey, bud. Where 'ya goin'?"
>
> "I'm going out to find my fortune," replied the Sea Horse.
>
> "You're in luck," said the Sponge. "For a small fee I will let you have this jet-propelled scooter so that you will be able to travel a lot faster."
>
> So the Sea Horse bought the scooter with his remaining money and went zooming through the sea five times as fast.

Soon he came upon a Shark, who said, "Psst. Hey, bud. Where 'ya goin'?"

"I'm going out to find my fortune," replied the Sea Horse.

"You're in luck. If you'll take this short cut," said the Shark, pointing to his open mouth, "you'll save yourself a lot of time."

"Gee, thanks," said the Sea Horse, and zoomed off into the interior of the Shark, there to be devoured.

The moral of this fable is that if you're not sure where you're going, you're liable to end up someplace else.[1]

In other words, there's nothing quite so useless as to do with great speed and efficiency that which need not be done at all.

Like the Sea Horse, many college and university managers are on a journey, only theirs is a career side-trip off an academic and research route. As you know, the path they are required to follow is fraught with obstacles arising from economic, political, and social events that restrict the range of alternatives, policies, and programs. Thus, college and university managers continue to express the desire for information that is relevant to their decision making and policy-formulating needs. Although these needs for information are not new, they are becoming more intense as a result of increasing demands to supply governing boards, legislative and administrative bodies, and other interest groups with answers to probing questions, justifications of resource requests, and disclosures of future plans.

In their haste to obtain planning and management information over the past several years, many college and university decision makers were led to believe that their needs would be met through the development of automated information systems. Like the Eel, some systems developers were able to convince these managers that by paying for systems development they would achieve their goal a lot faster. Like the Sponge, some systems developers affiliated with public and private agencies were able to convince institu-

tional decision makers that planning and management tools and techniques would provide timely decision information at a nominal cost. Unfortunately, many attempts to develop and implement automated information systems and various analytic tools have provided decision makers with far fewer benefits than expected when measured against their manpower and financial costs or the resulting utility of system output. This realization has recently caught the attention of those who propose to help institutions develop comprehensive, integrated information systems utilizing the most advanced technology available. Like the Shark, their appetite for resources can be insatiable. They can devise all kinds of clever ways to sustain themselves. For example, they often purport to have developed: 1) new schemes for identifying management's information needs; 2) new software systems to be implemented; 3) new hardware to be installed, and 4) new computer applications to be tried.

Those of you who administer data processing units must avoid creating the image of an Eel, Sponge, or Shark as portrayed in Mager's story. In addition, you must protect institutional managers from succumbing to the temptation of being conned by those outside the institution who fill these roles. What these people look for are college and university managers who have not clearly stated their needs for planning and management information and the potential uses to which such information could be put. The following points are presented for your consideration when trying to meet these challenges.

System Development Considerations

Information systems, ideally, should be created to satisfy operational reporting demands placed on the institution, as well as, provide knowledge

of the institution to support rational decision making. In my view, information can meet both these needs if created by carefully defining, collecting, evaluating, processing, analyzing, and interpreting data for operational control and decision making. This concept of information systems stresses that such issues as accuracy, reliability, timeliness, and ultimate utility of the data be carefully considered before proceeding with the design and implementation of systems used in its collection, processing, and reporting. With this introduction and without reference to priorities of concern, the following suggestions are offered for your consideration:

1. Identify the managerial strengths and shortcomings of institutional decision makers.

The management of most colleges and universities is characterized by shared responsibilities for planning, budgeting, and evaluating among several groups of decision makers: department chairpersons, deans, and executive officers. Typically, these individuals enjoy considerable autonomy when exercising the planning, organizing, and controlling functions of their offices. Thus, all three groups of decision makers have a need for systems that produce information in a usable form and at the right time. However, it is important to note that many of these persons lack familiarity with the wealth of data available through information systems and data processing capabilities of their institution. There are several reasons for this. For one, many department chairpersons, deans and top-level managers come to their positions from outside the institution, thereby lacking knowledge of institutional capabilities with regard to data processing services in general and information systems in particular.

Secondly, many of these decision makers lack management expertise

acquired through formal training and experience. Although it appears anomalous to speak of managers lacking management expertise this is often the case with regard to higher education. In fact, most college and university managers are hired because of their experiences and reputations as scholars rather than as successful managers. This statement is not intended to imply that teachers and researchers make incompetent managers. Quite the contrary, their knowledge of academic governance coupled with their ability to learn fast makes many of them able candidates to perform as effective academic leaders.

Thirdly, individual decision making styles influence significantly whether a manager utilizes automated management information. For example, a self-oriented dean or academic vice president might see a computer-based information system as threatening to his or her job security. The interaction-oriented manager might be more concerned about the interpersonal relations among those discussing issues or problems and therefore minimize the use of computer generated management reports. Still other managers have developed a negative image, through bad experiences, of computer generated information and the work of systems specialists. Therefore, they hesitate to investigate, or call upon, the services of data processing personnel.

To proceed with the development and implementation of information systems without first recognizing the styles, strengths and weaknesses of decision makers, is likely to result in products as useful as a building constructed on quicksand.

2. Identify the difference between operational and managerial uses of information systems.

Administrators of college and university data processing services must keep in mind the fact that educational enterprises vary considerably from their business and government counterparts. Corson, in his book Governance of Colleges and Universities, identified several of these distinguishing factors as follows:

1. The University's goals are not clearly defined and are comprehensive in character; they provide no specific guiding purpose; they give great opportunity for free play to faculty members and place large demands for leadership on presidents, deans, and department heads.

2. The product or service that the University produces is less tangible than that of many other enterprises.

3. The customers, that is, the students or their prospective employers, exercise limited influence upon the judgement of those who participate in making the decisions of the enterprise.

4. The faculty is made up of individuals who are highly specialized in many fields; most of them are committed intellectually and career-wise to a discipline or profession rather than to an employing university.

5. Like professionals in other enterprises, they expect the right of self-direction in their work, and the opportunity to participate in decisions that generally affect the conditions under which they work.

6. The right to participate in making decisions is diffused among a greater proportion of the participants in the enterprise than is typical of other forms of organization.[2]

These characteristics of colleges and universities have been preserved through the establishment of numerous support units charged with administering to the daily needs of institutional constituents, plus dealing with operational issues, crises, and problems of an immediate nature. Typically, data processing emerged as one of these support units. It was charged with aiding a variety of operational units with their data handling needs. As a

result such functions as admissions, registration, personnel, scheduling, payroll, accounting, and financial aids are frequently dependent on data processing services.

The handling of repetitive administrative tasks by support units frees presidents, deans, department chairpersons and faculty to exercise leadership through: 1) program, budget, and facilities planning; 2) policy setting and evaluation; and 3) the initiation of change through the establishment of structures and procedures designed to identify and achieve specific unit goals and objectives. This latter point is made possible because of the broadly defined goals that typically exist for most colleges and universities.

Due to the organizational differences among educational institutions, and between them and other types of enterprises it is often difficult if not impossible, to adopt information systems from one type to another. In addition, enough differences exist among educational institutions to complicate system implementation through exchange. Finally, information needs vary significantly among administrators of operational units and between the handling of administrative tasks and institutional management.

To proceed with the implementation of information systems designed for uses in other organizations may result in a dead end journey unless they are assessed in light of the operational and managerial idiosyncrasies of one's own institution. In addition, as Chaney has pointed out:

> ... it is a fundamental mistake to assume that a management information system will more or less automatically evolve as a byproduct of a good data processing system. They are different as to function and each must be planned, organized, and utilized appropriately to its purpose.[3]

When the primary clients of information systems are the operating units then their priorities naturally need to be reflected when changes are initiated. However, if managers have a need for information derived from these systems and changes are proposed by the operating units, then such changes should be justified. This is important because changes in such systems are often initiated to overcome an operational problem and therefore reflect little administrative thinking, provide limited changes to past ways of doing things, and seldom consider their impact on the data used by management.

3. Identify the uses of decision information.

Information system specialists must maintain a familiarity with the potential uses for management information if they expect their product to have management utility. One way this can be done is to identify the various issues and concerns relating to the planning, organizing, controlling, and evaluating functions that educational managers perform. For example, the three major planning areas of concern to these decision makers are program, budget and facilities. The organizing function evolves around the identification of alternative structures and procedures that managers may wish to implement. The controlling function is most often exercised through the allocation and reallocation of resources. Finally, the evaluating function typically focuses attention on a variety of matters including the expenditure of resources and workload policies. The challenge facing systems developers is to stay in tune with the timely issues facing managers for each of these functional areas.

In trying to understand the information needs of institutional decision makers, systems developers must become aware of how the use of institutional

data can help to address these needs. In so doing, they must strive to see that information systems and administrative data processing services will support the following three activities identified by Chaney:

1. Basic transaction processing and control, through operational data systems, to meet the particular needs of the various unit managers.

2. Comprehensive profile and exceptions reporting, to give program managers insights into the interrelationships, history, and status of data deriving from various related units, and meet external reporting requirements.

3. Projection information processing, to assist planners in evaluating policy alternatives by applying forecasting, simulation, and other analytical techniques to profile data.[4]

For most system developers, the immediate challenge is one of identifying the contents of comprehensive profiles and exceptions reports. Some argue this must be done by top management, yet my experience indicates very few of these executives are asked to play an active role in information system development. Even fewer deans and department chairpersons are asked to participate in such systems. Ironic as it sounds, of those managers who are asked to provide leadership in system development, many decline. This dilemma has forced many administrative data processing managers to rely on the managerial insight of administrative support personnel or play the most prominent role themselves in planning institutional management information systems. Experience has indicated that neither of these groups are able to anticipate the uses of decision information as a prerequisite to system development.

Another concern of top management and data processing administrators relates to projection information processing. This has frequently led to the acquisition of automated planning and management report generators and

analytic tools. At first glance, these tools seem relevant to management's needs until they start working with the reports. More frequently than not, such reports prove interesting but have little impact on the decision processes employed by managers throughout institutions.

In addition, only a relative handful of the nation's nearly twenty-five hundred colleges and universities are capable of standardizing the required data to support planning and management report generators. In some cases, reasons for this inability to introduce and utilize these automated tools are technical, that is, institutions lack trained personnel and computer hardware to implement and maintain them. In other cases, organizational and political alignments render the development and use of planning and management systems improbable because of the degree of intra-organizational coordination and centralization required. Yet, despite the inabilities of many colleges and universities to produce it, the need for management information continues to increase.

Challenges in Meeting Management's Information Needs

My previous remarks were intended to briefly outline several factors system developers should consider before proceeding in their work. My concluding remarks are intended to offer several suggestions regarding ways to better understand the information needs of institutional decision makers.

If administrators of data processing units are unfamiliar with the decision making styles of institutional managers, they should strive to overcome this knowledge deficit. This can be done by initiating informal discussions with decision makers to identify the issues and problems they face, the kinds of decisions they must make, and their need for and use of

information. Such conversations should focus attention on identifying the planning and budgeting needs of decision makers rather than the problems of data processors.

If this approach proves unsuccessful or institutional managers are inaccessible then a second strategy might be employed: discuss these topics with staff members who prepare planning and management information for institutional decision makers. Typically these staff include personnel in the planning, budgeting, and institutional research offices, as well as, department and college administrative assistants. These individuals have an interest in information systems since they utilize data as their raw materials and computer systems as their tools. Their roles are directed toward constructing an information foundation upon which are built decision alternatives linked to planning, organizing, controlling, and evaluating issues and concerns. These staff are usually very concerned with identifying ways to automate and improve the reporting of data elements frequently used by decision makers. Their concern for such matters as data element definitions, collection, and processing will more often than not help to identify shortcomings with operational reporting systems and suggestions regarding their improvements.

The challenge facing systems developers is to help initiate changes in operational reporting systems to enhance their utility in providing management information. Since data processing administrators generally provide an important link between administrators of support units and users of management information they are in an excellent position, in my judgment, to promote discussions between these interest groups and then implement changes in automated reporting for their benefit.

Several fruitful outcomes can occur as a result of such discussions. For example, managers or their support staffs are encouraged to identify the issues and concerns confronting institutional leaders. In this context the need for, and use of, specific information becomes clear; as do the shortcomings of existing information systems. Discussions of this type will help system developers identify what changes are perceived as needed, as well as, informs managers of the logistical and resource considerations inherent in their adoption. This fact affirms the following point made by Balderston:

> Data systems need to be reliable instruments for analysis and for providing evaluation information, but these data systems are necessarily compromises because they must serve so many masters. These inevitable compromises cause any data system to be less than perfect for some of its users.[5]

This reality will pose another challenge to systems developers, that is, accepting a less than perfect information system when measured against developer's standards. This is one of the consequences of integrating management information considerations with the needs for operational reporting systems. However, the dual involvement of these groups of institutional constituents helps to insure that such issues as data accuracy, reliability, and timeliness are considered adequately.

When information system specialists are asked to modify existing operational systems they should avoid the temptation to consider only the technical ramifications associated with such changes. Since most data systems for operations are products of administrative evolution and managerial neglect those requesting changes should also justify their need and their implications for enhancing data use by institutional decision makers. In this way, system developers are able to utilize administrative reporting problems as their opportunity to enhance the development of management

information. For example, requests by the Registrar to change an element in the student master file could have profound implications to planners or institutional researchers who must also utilize this data. Although such changes may appear minor, information system developers should question the impact such changes might have on all users of these systems. Thus, system developers and data processing managers are challenged to transcend organizational boundaries and, as suggested earlier, develop rapport with those who prepare management information, e.g., staff planners, institutional researchers, budget analysts, etc. Generally these people would be most happy to identify the potential impact system changes would have on their work.

Another thought I wish to share relates to the implementation of automated planning and management tools and techniques produced by public and private agencies. If institutional managers request that they be implemented, data processing administrators should question the utility of these tools in the context of acceptable decision processes and existing management styles. Tough questions should be asked of managers relating to the usefulness of reports produced, their application to planning and budgeting processes, and decision maker involvement in their implementation. If data processors are convinced that such systems will have utility to decision makers then they should investigate the feasibility of being able to implement them within their institution. In so doing, careful consideration should be given to estimating the time and resources needed to operationalize such systems before they are purchased or initial implementation steps are taken. In other words, careful consideration should be given to the operational aspects of capturing and formating the data input to these

systems. Is it accurate and reliable? If not, can these shortcomings be overcome? If they can, would the cost still be worth the effort? Answers to these basic questions are essential if decision makers are going to utilize planning and management systems with confidence. More importantly, they help managers to avoid falling prey to those I characterized earlier as Sharks because they encourage college and university managers to clearly state their needs for planning and management information and the potential uses to which such information will be put.

In closing, I wish to emphasize the important service system developers can play in ensuring that operational reporting systems aid in the preparation of planning and management information systems. In my judgment, to ignore these concerns greatly inhibits the contributions system developers can make on behalf of the clientele they serve. In meeting this challenge, system developers should feel free to solicit the support of top management's planning and institutional research support staff, as well as, those who prepare administrative and management information for deans and department chairpersons. This calls for system developers to exercise leadership in fact-finding with regard to user needs, and problem solving with regard to system development.

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[2]John J. Corson, Governance of Colleges and Universities (New York: McGraw-Hill Book Company, Inc., 1960), pp. 141-142.

[3]John F. Chaney, "Information Systems: The Objectives of the Involved Executive Manager", (paper read at the Eighth Annual Conference, American Institute for Decision Sciences, San Francisco, California, November 10, 1976), p. 86.

[4]Ibid., p. 85.

[5]Frederick E. Balderston, Managing Today's University (San Francisco: Jossey-Bass Inc., 1974), p. 238.