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DESIGNING AN INFORMATION SYSTEM FOR STUDENT FINANCIAL AIDS

LeRoy J. King

Dan J. Wedemeyer

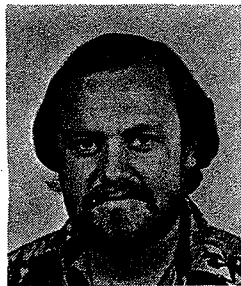
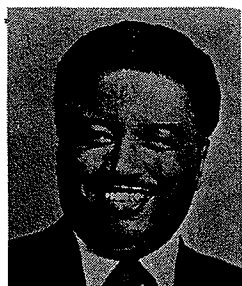
Although student financial aid procedures vary throughout the U.S., there are many similarities which, upon close analysis, can be systematized to provide significant benefits to both the consumer (student) and the institution.

These benefits include: (1) quicker response time, (2) reduction of the forms inventory, (3) elimination of duplicated stored information, (4) significant savings in personnel and overhead costs and (5) increase the time available to respond to students who require a more personalized service.

Similarities of Various Financial Aid Systems

Throughout this article there will be a stress on the similarities which exist among the variety of U.S. postsecondary educational institution's financial aid functions. It is these similarities that make optimization possible. The similarities inherent in most institutional financial aid systems are:

- (1) *A general need analysis input such as CSS or ACT:* A method of standardizing input throughout the U.S.; preliminary collection of financial information from parents and/or students.
- (2) *Additional local information captured:* This information is unique to each institution and assists in the award function.
- (3) *Aid (packaging) decisions:* This decision function is done manually in varying degrees throughout the U.S. and is based upon the individual student's particular financial and academic needs.
- (4) *Notification to student of awards:* The award formalizing process which usually requires the generation of some form of an award letter.



Left: LeRoy King has recently been appointed Provost of Windward Community College, University of Hawaii. Prior to this assignment, and at the time the article was written, he was Director of Financial Aids at the University of Hawaii at Manoa from 1969-1973.

Right: Dan Wedemeyer served as Financial Aid Graduate Counselor for three years while completing his Master of Arts Degree in Communication at the University of Hawaii.

- (5) *Internal storage of information*: The process of capturing and maintaining information and statistics about individual students and programs.
- (6) *Statistical reporting to local or federal sources*: The process which depends heavily on captured internal information maintained throughout the award year.

Need for System Analysis

There are few systems which cannot be improved by making a close analysis of functions and services. Many systems develop in a "piecemeal" fashion, adding tasks, functions and forms as situations arise. This form of system development generally leads to wasted time, effort and money. Usually such a system maintains a significant amount of duplicated information and files at various points with very little centrality or sharing of common information. A second general characteristic is the continuance of functions long after their original need has passed. Comments such as, "I don't really know why we do it, we always have . . ." are common in this situation. A third characteristic of a haphazardly evolved system, is that manual functions are routinely performed without questioning. Many of these functions could be easily and more efficiently converted to machine functions without loss of quality control of personalized service.

Reluctance to Introduce Change

In many situations obvious system shortcomings are not altered because of a variety of reasons. These reasons can take the forms of:

- (a) *A threat to job security*: The fear that any change in the system could result in a force reduction. The need for a particular individual's area of responsibility would be reduced and eventually discarded.
- (b) *A general resistance to change*: It's often more comfortable to work with the old system, regardless of its obvious shortcomings, than to adjust to new methods and approaches.
- (c) *A threat to ego*: Suggestions for change may result in bypassing a particular individual's area of expertise; he or she may no longer be a central figure in the new system.
- (d) *Superior-subordinate relationship which would be altered*: By changing methods of operation, there may not be the opportunity to maintain an existing superior-subordinate relationship which has been developed over long periods of mutual dependency.
- (e) *Depersonalization of services*: A common fear among humanists who perceive machines as disregarding human needs and wants.
- (f) *Loss of control by personnel within the system*: Any proposal of a change could remove control from one or more persons and reallocate it to the group or a computer.

Generally these points can be overcome by following and remembering some key points while assessing the system and proposing changes.¹ They

1. Ross, Joel and Schuster, Fred. "Selling the System". *Journal of Systems Management*, October, 1972, pp. 8-10.

will be discussed in detail later in the article. The following discussion will describe major steps and elements which should be considered at the time the need for change is assessed, during the design phase for a new system if one is indicated and while the new/revised system is being implemented. They can have a further use as evaluative guidelines after implementation.

(1) *Defining Objectives*

At the outset it is important to define the purpose and objectives of analyzing any system. In this instance the purpose is to analyze objectively the present operation to determine the feasibility of developing a total system approach to the delivery of financial aids services. An example of an overall objective of such analysis can be listed as:²

The basic objective of the financial aid information system is to provide those responsible for the administration of student financial aid with a tool to improve the student personnel aspects of their programs, to improve the utilization of the student aid funds under their control and jurisdiction, and to improve their managerial capacities. Ultimately, the objective of the system is to make more time, personnel and money available for the significant functions of financial aid: seeking out and counseling capable young people who lack the means for higher education.

(2) *Describing The Present System*

The second step in systematically analyzing any system is to describe, in detail, the present method of operation. This includes an organization chart, a flow chart of each major task, descriptions of each program and sub-function, a sample of each form used and a matrix of information maintained by each program/function.

(3) *Defining The Organization Chart*

The organizational chart is important in determining who reports to whom — and can indicate supervising overload or underload situations. It also serves as a personnel information base. The organizational chart does not necessarily change as a result of system reorganization, but it is important to define clearly these relationships at the outset of the system assessment.

(4) *Defining The Flow Chart*

The flow chart serves as an important tool to describe graphically each individual's job. In many situations it clearly indicates overloaded, duplicated or outdated functions. The flow chart can also be used to assign time and costs to the various tasks. These assignments can be used to determine the "particle" cost of one student to be processed through a given system. It then becomes possible to examine each of these functions and determine alternative changes which will subsequently reduce the "particle processing time" without reducing personalized service to the individual student.

2. IBM, College Entrance Board Financial Aid Information System. New York, 1968.

(5) *Describing Each Program*

This activity serves as a definition of terms and program relationships. The assessment should be done by each individual in charge of a particular program. This also serves as information input to the analyst and encourages those involved with the particular programs to examine closely the functions involved. In many instances the program description will initiate possible alternatives for later changes in the methods of program administration.

(6) *Providing Samples of Each Form Used*

This activity is important in determining the total number of forms used by the present system and serves as input to the analyst on the types of information being captured (i.e. student's name, social security number, address, parental information, income, etc.).

From the forms collected, an information matrix can be developed. An information matrix is a grid with the types of information captured along the top and the individual form types along the vertical side. By taking the forms for each function and marking the corresponding information captured by each particular form, it becomes possible to detect excessive duplication of information.

(7) *Providing An Analysis of Information Collected*

After this information is assembled from the individual functions and forms, the analysis process begins. Questions such as the following should be asked:

- (1) Is there excessive duplication of information or forms within the system?
- (2) Who maintains duplicated "common" information?
- (3) Is the information necessary and appropriate at that level?
- (4) Are there outdated tasks still being performed?
- (5) Are there manual tasks which can be readily converted to machine tasks?
- (6) Can many forms be compressed into one or fewer forms?
- (7) Should some forms be retained but redesigned?
- (8) Can some tasks be discarded or relocated to lower traffic areas?
- (9) How long do forms wait to be processed and why?
- (10) Can some functions be naturally combined?
- (11) Are some tasks excessively costly or time consuming?

Questions such as these can lead to redesigning a more efficient/personalized financial aids information system. A system that is internally efficient should be able to respond more quickly and personally to the student awaiting the aid decision.

Proposal for Change

When it becomes evident that system changes are needed, it then becomes important to affect these changes within certain guidelines. These guidelines are simple but without observance of them the best system design can be destroyed. An analyst should make every effort to:

- (1) Involve personnel whose functions will be altered in the design process.
- (2) Take individual and social situations into account. Take work groups into account. These aspects are important in getting the evolving system accepted.
- (3) Carefully assess the technical and physical parameters of the situation. It is unreasonable to propose a conversion to a computer based system if one does not exist or has limited capability, or cannot accommodate additional terminals and/or programs.
- (4) Select assistance from competent personnel, such as computer programming specialists, form design experts and humanists. These individuals have developed expertise in their particular area which will contribute significantly to the final system design. In a sense the analyst becomes a project manager, coordinating knowledgeable personnel to accomplish the end goal (s).
- (5) Work closely with the directors or administrators of the present system. The best designed system is impossible to implement without the administration's support. Each director/administrator should be consulted and kept abreast of developments as the analyst works. A competent administrator can add valuable support to the system assessment. In addition, in the final stages it is the administrator who makes the decision to accept or reject the suggestions made by the analyst.
- (6) Guard against any action to computerize any aspects which rightfully belong in the realm of human judgment.

A Selected Example: University of Hawaii, Manoa

Nearly one year has passed since the University of Hawaii Financial Aids Director and Dean of Students sensed a potential problem developing. The situation projected an increase in the number of students seeking financial assistance in the coming years, yet significant budget and personnel cuts were also on the horizon.

The situation was further complicated by rumors of a substantial tuition increase and a potential decrease in students' abilities to obtain part-time employment.

The final solution was to take a critical look at the internal functions of the Financial Aids Office and attempt to optimize the system's efficiency.

Description of the Parameters

The Financial Aids Office was responsible for in excess of five million dollars in grants, scholarships, loans and on-campus employment. There were two full-time counselors, one additional counselor on sabbatical and one director. A staff of six Civil Service employees supported the operation assisted by ten part-time student employees. The total applicants for the previous year totaled 3,600 — estimates for the following year, 5,600. This situation was further aggravated by a State hiring freeze and substantial cuts in State legislative appropriations.

The analysis was initiated in September and was completed in December.

The findings included evidence of duplication of internal log cards, expensive manual generation of student award letters, laborious methods of ordering loan and scholarship checks, and difficult manual methods of maintaining student and program statistics.

These findings resulted in the following proposals:

- (1) To condense the 12+ individual log cards into one pre-printed multi-copy, master log card generated by computer (using the CSS card). The master log card would be centrally maintained in the Financial Aids Office, contain all data pertaining to each individual student, and easily updated or corrected.
- (2) The student award letters would be generated by computer, using keypunched award cards on pre-printed continuous forms.
- (3) Program and student statistics would be maintained by the captured information from CSS card and the internal award cards. This program would also generate a check order roster as well as maintain total program expenditures.
- (4) The system would be designed to interface a later system which would be easily adaptable to an on-line data system as the central computer is able to service additional remote terminals.

Summary and Conclusion

The present situation indicates that a smooth transition has been made into the new system. The personnel involved are performing at a higher level of efficiency, developing new skills (such as keypunching, computer logic, etc.) and generally have more time to serve the additional student inquiries at the information windows.

The previously foreseen crisis was substantially reduced by early, effective conversion from a relatively manual, "piecemeal" operation, to a highly efficient and personalized financial aid system.

The final statistics indicate that the change had, in fact, brought about substantial savings while being able to serve the additional students requesting services.

The total savings for the adopted proposals are as follows:

- (1) A reduction from 19,115 forms/year to 9,750 (48.9 percent savings)
- (2) A reduction of elapse processing time per student (i.e. response time) from 32.5 days to 25.5 days (23.5 percent savings in time)
- (3) A reduction of cost per student processed from \$2.42 to \$1.20 (a savings of 49.6 percent in costs)

Because there are similarities in university financial aids operations throughout the United States, it is possible that similar systems can be designed elsewhere. The important thing to remember is that financial aid systems are designed to benefit the consumer (student). Steps should be taken to systematize only those functions that strive toward that goal. It is sometimes very easy for a systems analyst to optimize an operation that only a machine could apply and receive financial assistance. Computers do not require financial assistance to obtain a higher education at the postsecondary level; students do.