DOCUMENT RESUME

ED 123 765 EA 008 321

AUTHOR Woolpert, Dan G.
TITLE Budgeting and Accounting Within the Structures of the CCL Management Information System.
PUB DATE Apr 76
NOTE 11p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, California, April 19-23, 1976)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Accounting; Computer Oriented Programs; *Management Information Systems; Management Systems; Man Machine Systems; *Program Budgeting; *Program Design; *Research and Development Centers; Systems Development
IDENTIFIERS Wisconsin Center for Cognitive Learning

ABSTRACT

This paper describes in detail the design and operation of the program budgeting and accounting system developed for use at the Wisconsin Center for Cognitive Learning (CCL), an educational research and development center based at the University of Wisconsin/Madison. The CCL system uses a computer to generate a variety of budget data and accounting reports, while attempting to minimize the constraints imposed on program personnel by data reporting requirements. The author discusses the organizational structure of the CCL and describes how the computerized management information system interfaces with the center's programmatic staffing structure. (JG)

AERA
April 21, 1976

BUDGETING AND ACCOUNTING WITHIN THE STRUCTURES OF THE CCL MANAGEMENT INFORMATION SYSTEM

Dan G. Woolpert
Director, Management Services
Research and Development Center
for Cognitive Learning
University of Wisconsin-Madison

The Management Information System now in use by the Wisconsin Center for Cognitive Learning was designed to facilitate integrated program planning/monitoring and programmatic budgeting/accounting. Dr. Bush has dealt with programmatic planning and monitoring. I will focus on budgeting and accounting. However, in that the system is truly integrated, I will be frequently referring to concepts presented in Dr. Bush's paper.

Initially, I would draw a distinction between programmatic budgeting/accounting and business accounting. The legal fiscal agent for the Wisconsin Center for Cognitive Learning is the Board of Regents of the University of Wisconsin System. University fiscal administration maintains the official auditable fiscal records related to Center contracts. The internal budgeting/accounting system is focused on programmatic allocations of resources and costs. While no significant discrepancies exist between the internal records and the University's records (we reconcile one set against the other to ensure that significant discrepancies do not exist), clearly the objectives of the two systems are different. The University system assures that funds are utilized legally. The internal system provides information about how funds are utilized programmatically.

Programmatic Units/Staffing Units Interface

As Dr. Bush has indicated the first, and critical, problem faced in developing the system, was the creation and implementation of a viable programmatic structure. Programmatic fiscal accounting in its simplest terms amounts to assigning costs appropriately to units in this structure. At the Wisconsin Center we immediately faced another problem. The Center staff was not organized in a structure that was congruent with the programmatic structure we developed. Many organizations attempt to utilize one organizational structure for both program and staff. For this application that seemed impractical if not impossible. It was, therefore, decided to define and utilize a staff unit structure separate from the programmatic structure. The staff unit structure in use is significantly different from the program structure in that it is not hierarchical. In our organization nearly everyone works for only one supervisor and nearly all supervisors report to the Center Director. Therefore, a simple flat structure, a list in fact, was suitable. Figure 9 illustrates the matrix that is produced when the staff unit structure is interfaced with component level of the program structure. It is, of course, possible to interface the staff unit structure with any and all levels of the program structure. The resulting matrix, however, is so large and complex that it is more confusing than helpful to use it for illustrative purposes.

In Dr. Bush's discussion a component was defined as a major product requiring the employment of a project staff with highly specialized content expertise. Note that the 1000 series staff units, are project staffs who work in a relatively limited number of components. The 9000 staff units are support personnel. While their

expertise is no less specialized, it is generally applicable across many components. The 9600 and 9900 staff units, those working in business and management services are spread so evenly across components that it is impractical to charge any part of them directly and they appear totally in overhead components. Notice also that in utilizing this system, it is the programmatic structure, not the staff unit structure, that defines overhead. For instance, support section individuals that spend any significant portion of their time working for a directly fundable component, charge that portion of their time to that component.

Utilizing the matrix I can also point out variations of interest in fiscal information. Center management, persons with programmatic responsibilities and funding agencies are generally interested in column totals. They are primarily concerned about what a particular program unit is budgeted for, has spent, etc. While they may be interested in which staff unit is over spending or under spending, it is generally the total across all staff units that is of interest. A staff unit head, on the other hand, is primarily interested in the row totals. While he needs to monitor which programmatic units his staff is working on, he generally is concerned whether he can get all his work accomplished within the total resources he has available. Staff unit heads are given substantial flexibility in transferring resources along a row from program unit to program unit as long as the work gets done. Transferring resources up and down a column from staff unit to staff unit is much less common. In a closed system where one staff can gain resources only by subtracting from another the reallocation of funds is a major decision falling to Center Management.

Accounting within this matrix is a complex problem. There are currently

558 cells alive. In developing the MIS a decision was made to place the major burden of this complexity on the computer and secondarily, on the business staff. A conscious effort has been made not to burden the remainder of the Center's staff.

Resource Files

The system utilizes several resource files. Figure 10 lists the four major resource files and indicates the kind of information contained in each. To touch on each briefly the program catalog defines all program units and carries begin and end dates for each. It also carries for each task one or more fund codes. Fund codes are specified in the fund index, a listing of all the Center's fiscal resources past and present. It is at the task level that contractual funding constraints are set. Most tasks are supported by one or more federal contracts and one or more University sources. While tasks are frequently supported by more than one contract across time, they are rarely supported by more than one federal contract at any one point in time. The personnel file contains employment information about each staff member. The class code file utilizes and expands upon the University's system of classifying expenditures into various cost categories such as salaries and wages, travel, etc.

Basic Accounting Unit

The basic accounting unit used is the charge card illustrated in Figure 11. We utilize an 80 column card image that gets expanded to 120 characters as additional information is added during data processing. A separate card is generated for each identifiable expenditure or part of an expenditure in cases where one expenditure requires multiple coding. I would point out that the information contained in each charge card is inclusive of all structures in which the Center may

want to account. In addition to programmatic and staff unit structures discussed above, the data can be sorted, processed and reported in a time structure, funding structure and cost category sturcture.

Programmatic Budgeting/Accounting Strategy

The Wisconsin Center's MIS is used for both budgeting and accounting. The overall strategy of fiscal aspects of the MIS system is to collect data, process it as necessary until it is in charge card format, sort it appropriately and generate a report. I will deal first with collecting and preparing budget data for summarization then with collecting and preparing accounting data for summarization and finally with summarizing and reporting which is identical for both. A prerequisite to data collection is to have the programmatic and staff unit structures identified. A prerequisite to data processing is to have all resource files in updated condition.

Collecting and Preparing Budget Data

All budget data is generated by project staff who are familiar with the work being proposed. Three types of data are collected. The first is partition data. Figure 12 illustrates the partitioning concept. In every staff unit there are certain individuals whose commitment to a particular effort is a precondition to operation. Typically, these individuals - the staff unit head, a coordinator, a secretary - work in a large number of tasks. We first identify the total population of tasks that an individual to be partitioned will work on and then the programmatic hierarchy above them. At each successive level the individual is asked to proportion his time to the various programmatic units. In each instance and at each level, they work with 100% or parts of a whole. The second type of budget data - direct labor - is

collected on the sheets illustrated in Figure 13. In this instance, the staff unit head is asked to indicate what labor it will take to complete a particular task. Either named individuals or labor types can be budgeted. The labor amount is indicated by a percent within a specified time frame. The third type of budget data, covering all non-labor costs, is collected on the sheet illustrated in Figure 14. Travel is identified by the project staff and cost estimated by the business staff. This is not, in my opinion, the most reasonable way to budget travel. However, nearly all funding agencies seem to require this type of detailed justification. Services and supplies require two inputs each. We know from past accounting data that every FTE in the Center will use up ± $750/year in copying and other miscellaneous services and $100 in books and other miscellaneous supplies. These are calculated in an a x b x c fashion where a = FTE for a particular staff unit for a particular task; b = a factor ranging from .5 to 2. and c = constants of $750 and $100. Factors other than 1. are not used unless there is substantial reason to believe that the work involved will require abnormal usage of common services or supplies. Project staffs are also encouraged to identify as completely as possible predictable expenditures for services and supplies. As with travel information, this data is collected in descriptive fashion and later cost estimated by the business staff. Equipment needs are identified in similar descriptive fashion by project staff and cost estimated by the business staff. Figure 15 illustrates the processing required to prepare budget data for summarization and explains the functions of each processor. Basically, the partition data processor evaluates the partition data and outputs in direct labor data format. The processed partition data is then combined with the direct labor data. The direct labor processor outputs charge cards. These cards are run through a program that sums FTE by programmatic unit and

staff unit for use in calculating normal service and supply budget entries. The other cost processor generates 1-5 charge cards per input record. Figures 16 through 22 present examples of the inputs and outputs of the various processors.

Collection and Preparation of Accounting Data

The difficult problem to solve in a labor intensive effort, particularly in an academic institution such as the Wisconsin Center is the collection of accounting time charge data. Even the thought of time reporting is offensive to many of our staff. We have not solved the problem but we have developed some unique techniques that you may find interesting. In developing these procedures, we were attempting, as noted above, to maximize the load on the machine and minimize the load on the reporting individual.

It has been my observation that a few characteristics of time reporting are really obnoxious to certain individuals. Given as a requirement that they have to do it, they specifically don't like to a) report only 40 hours in a week when they know they put in 52, b) not report Saturday when they missed golf to complete a proposal, c) readjust percentages until they equal 100%, or half time or whatever, or d) report in percents if they tend to think in days or hours or vice versa Figure 23 is one of our time reporting forms. It comes to the individual preprinted with all necessary information except programmatic codes and time allocations. Even these are preprinted if the individual files an estimated time budget each academic session. He may report his time in percents, days or hours or any combination thereof. The only constraint is that only one time indicator per

programmatic entry can be used. One may not, for instance, indicate that he worked a third time and two days on a particular task. As you might expect, data reported in this fashion rarely totes out to the level of effort that an individual is appointed for. The time charge processor converts the data to a common denominator (FTE) sums it and, gathering information from the personnel file, compares the sum to the appointment information. It then balances the data for a particular time frame proportionately or as per the instructions on the bottom of the time sheet adding or subtracting from one or two tasks as appropriate.

For years Center staff have been required to fill out request forms to generate actual expenditures. A sample is included in Figure 25 Note that both programmatic and staff unit coding are required. This is the only new information that was required with the implementation of the MIS. All other information for the resulting charge cards is acquired and added in the business office. Figure 24 illustrates how hourly employees report their time. Again, only programmatic and staff unit coding was added as a result of the MIS. Wage data in the accounting framework is handled like other cost data.

The preparation of accounting data is less complex than the processing of budgetary data. Figure 26 is a flow chart illustrating this process. Figures 27 through 29 present examples of the input and output for each processor.

Reporting

A single summarization program is utilized for all reports. The input is a file of charge cards sorted appropriately. Figure 30 illustrates the data summarization process. The summary output for a task is

illustrated by Figure 31. A list of all charge cards is printed followed by a summarization of those by cost category and by type. Budget data sums appear in the first column and accounting data sums appear in the second. The third column - balance - is the difference between the first two. These summarizations are accumulated upward in the programmatic hierarchy to the milestones, activity, component, function and program levels.

The format of reports presented to Center management and principal investigators has changed several times since the implementation of the system. Initially, the output of the report program was distributed. We quickly found out that only a few users were interested in complete detail. Figures 32 and 33 are the latest versions of reporting formats. Figure 32 is a programmatic report and figure 33 is a staff unit report providing the staff unit head detail by cost category. By examining the two reports, the responsible parties can identify problem areas and pursue the necessary detail in the full reports.

Currently these reports are hand generated. If and when we find a reporting format that is generally accepted, we will program the machine generate it.

Final Considerations

In conclusion, I would like to touch on a few operational aspects of our system that may or may not be unique. One of our objectives is to do the best job possible of assigning costs to programmatic units. When a staff member reviews a charge list for a task and identifies charges that he thinks would be more appropriately coded elsewhere, we recode the data. We have no preconceptions about the validity of the first opinion of where a charge fits in the structure relative to second, third and fourth opinions.

In recent years, we have found labor indicators to be consistent requirements of funding agencies. We use FTE (annual full-time equivalent) which is readily convertible to man months, man years workdays or hours. The FTE concept is integral to the operation of the system - it is FTE that is distributed in the partition program and FTE that is used as the common denominator in the Time Charge balancing program. Both budget and accounting data carry FTE and the Report program sums FTE at all summarization levels. It has taken several years but finally most of the Center staff understand the FTE concept and can think in terms of FTE as well as straight percentages.

As Dr. Bush indicated, the third processing level is the budgeting/accounting level within the Center. In submitting request forms and time reports, the Center requires programmatic coding to the task level. Many supervisors, however, require their staff to code a lower levels of detail in order to more thoroughly monitor resource utilization. In 1975 23% of the data was voluntarily coded to the element level and 35% was coded to the work package level.

Our decision to burden the computer and the business staff in order to unburden the Center staff has not resulted in total unburdening of the project staff. From their point of view providing data for the MIS and reviewing MIS reports is an imposition on their time that they would prefer to do without. The argument that it could have been much worse is not effective with a staff that has not been used to providing programmatic data and having substantial additional detail about their work visible to management and peers.