
Use of Microcomputers for Library Financial Planning

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The purpose of financial accounting is to maintain control of financial resources. Library administrators are allocated financial resources for the purpose of carrying out the mission of the library. Because a library rarely receives sufficient resources to meet fully all aspects of its mission, financial control becomes critical in order for resources to be allocated effectively to meet immediate and long-range priorities.

Whereas financial accounting is a system of "keeping track" of money, financial management is a process of allocating resources. These two functions are often performed by technical staff (accountants) and by administrators respectively. Library managers need current and accurate financial data to make critical resource allocation decisions. The implementation of library accounting functions on a microcomputer can aid in making both the accounting and the managerial functions more effective.

The Library Budget

Today libraries often receive annual budget information in the form of a computer printout. Since most libraries, school, public, special, or academic, are part of a larger organization, their budgets generally are derived as part of a larger computer budget run. Usually the parent organization's budget is maintained and updated on a large main frame computer housed in some system/computer center remote from the library. Many library administrators consider themselves fortunate if they receive monthly updated printouts of their budgets from the central accounting office.

Although these updates are "current," they are seldom "real time," i.e., seldom do they reflect the library's transactions performed immediately prior to or since the computer run. Often due to the organizational distance between the library, the purchasing department, the accounting office, and the computing center, there can be a signifi-

cant discrepancy between the update reports and the actual state of the library's budget. The lack of real time data can be especially critical as budget lines become depleted and at the end of fiscal years. In order to compensate for this lag in budget information, libraries usually set up an internal bookkeeping system and maintain manual account information within the library. However, internal records are seldom the final budget word. The monthly updates should be reconciled systematically against the library's records to ensure that all transactions have been recorded and to correct errors made either in-house or by central accounting.

Depending on the size of the budget and the complexity of the library organization, the in-house accounting system can range from very simple to quite elaborate, requiring a staff of five or more to maintain. Almost all libraries, even one-person branch operations, have some budget allocation for materials and devise some accounting system to keep track of funds encumbered (books ordered), funds expended (books received), and fund balance (money remaining to spend). Library bookkeeping systems can vary from solitary accounts of a few hundred dollars to systems that provide for personnel, materials, equipment, supplies, travel, maintenance, computer expenses, etc., and amount to many million dollars.

Financial Accounting and Budget Management

Two key elements of accounting (the systematic recording of revenues and expenditures) are 1) to record where monies are spent, and 2) to reflect how much monies are left to expend. To maintain records of budgeted funds, ledgers are established in accounts and subaccounts to reflect expenditure responsibility (library administration, chemistry library, social science bibliographer) and source of funds (budget lines: student wages, books, equipment). To track fund balances, each account contains cells to record allocated funds, encumbrances, expenditures, and free balances. If encumbrances and expenditures are posted in a timely fashion and accounts summed, balances can be maintained that reflect

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a realistic current state of the budget. Creating an up-to-date or current picture of the budget for a small organization can be accomplished with a minimum of effort; for larger, more complex budgeting units, balancing accounts can be a time consuming and costly function.

The use of a microcomputer, with concomitant application of spreadsheet software or an accounting package, can simplify and accelerate the internal accounting process. By providing high speed computing power, data storage, and ease of data entry, the in-house microcomputer can be a tool that makes accounting more efficient and provides a possibility for more effective financial management.

Accounting is only one aspect of financial management. In addition to keeping track of the money expended in each account, financial management also entails setting up the budget (allocating sums of money to each account), monitoring the rate of expenditures, and adjusting the budget when appropriate. To make effective budgeting decisions, managers compare current spending rates with previous patterns, weigh the current rate against expected future conditions, and adjust the budget to ensure the total budget is expended as intended. The electronic spreadsheet provides an array of statistical and computational functions that can aid the librarian in determining rates of expenditure and in making comparisons of financial data.

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The Microcomputer and the Electronic Spreadsheet

"According to Larry Blasko, ten years ago the personal computer was in the same league as the personal army—cumbersome, expensive, and not really very useful for problems below the global scale."¹ This may have been true ten years ago when the knowledge of a programming language such as BASIC was necessary in order to perform simple operations on a microcomputer when the capacities of microcomputers were limited to a few megabytes, and when the cost of the machines relative to computing power was very high. Today, however, due to the price competition in hardware, the proliferation of software developers, and the "user friendliness" and variety

of software (word processing, spreadsheets, data base management, communication, etc.), the microcomputer has become a viable tool for almost every library.

The microcomputer itself is a tool not unlike a power drill, very useful and powerful but only with a drill bit. Just as different kinds of drill bits are needed for various purposes, different software serve different functions and achieve different goals. The microcomputer used with a spreadsheet is particularly useful as a tool for the purpose of library financial management.

Microcomputers, when used with one of the standard spreadsheets such as VisiCalc or LOTUS 1-2-3, make excellent high speed calculators. But the electronic spreadsheet makes the computer more than just a calculator. It also makes it an easy and efficient programmable device for setting up budget accounts, producing reports, and creating charts and graphs. Any number of commercially available spreadsheets can be used (depending on the make of the machine and personal preference) to set up a financial accounting and reporting system for a library. This discussion is based on experience with LOTUS 1-2-3.² The 1-2-3 electronic spreadsheet is flexible enough to be used with a single book account or a budget exceeding six million dollars.³

In addition to their calculating power, there are many characteristics and functions of electronic spreadsheets that make them useful for financial accounting and easy to learn and use. Without going into great detail or describing all the attributes of an electronic spreadsheet, some of its more useful functions are:

- *Cell/range copy* Formulas, functions, and formats can be copied from one cell or range to another. Once an individual line or account has been set up, it can be copied at other locations on the spreadsheet. The copy function reduces key-stroking and the possibility for error when designing and setting up a set of spreadsheets.
- *Arithmetic functions* Cells can be programmed to sum, to average, to count, and to calculate percentages. These functions are performed automatically each time data is changed or new data added. Automatic calculation can make the account "real time" with each data change.
- *Data transfer and import* Data can be extracted, copied, added to, or subtracted from one location in a spreadsheet to another or from different spreadsheets automatically. This capability makes it possible to

TABLE 1.
Sample Spreadsheet Statement

ADMINISTRATIVE SUMMARY		12-Jan-89			% Year Remaining: 48.5%	
Account Name	Budget	Encumbered	Expended	Balance	% of Funds Remaining	
Salaries	1,832,223		878,072	954,151	52.1%	
Wages	295,860		127,925	167,925	56.8%	
Term. Pay - Mo.	1,304		1,511	(207)	-15.8%	
Term. Pay - Bi.	2,574		2,574	0	0.0%	
Graduate Asst.	212,728		109,803	102,925	48.4%	
Students	304,422		132,633	171,789	56.4%	
Travel	31,000		12,787	18,213	58.8%	
Operating Serv.	147,684	42,955	107,576	(2,847)	-1.9%	
Computer Serv.	36,000		19,086	16,914	47.0%	
DP Analyst Serv.			1	(1)		
Supplies	115,500	12,744	71,054	31,702	27.4%	
Prof. Serv.			314	(314)		
Other Serv.			77	(77)		
Capital Outlay	6,033	20,748	2,373	(17,088)	-283.2%	
Capital Repairs						
TOTAL:	2,985,328	76,447	1,465,786	1,443,095	48.3%	

transfer data electronically from the materials or personnel spreadsheet to a summary spreadsheet; data only needs to be keyed into the accounts once.

- *Macros* Macros are internal programs written to perform repetitive and/or complex sets of functions. They can be written to aid data input or to perform a set of steps necessary to update a summary statement.
- *Graphics* Line graphs, bar charts, pie charts and xy graphs can be plotted easily and interchangeably with 1-2-3. Graphs can give pictorial comparisons of current and historical data. They are particularly useful in conjunction with "what if" analysis; a graph can depict the outcomes of several courses of action in one easily understood visual representation.

In addition to the functions mentioned here, there many more standard operations (statistical, complex financial, data query) that make the spreadsheet useful for library financial management.

Spreadsheet Lay-out and Maintenance

Table 1 is an example of a printout from a 1-2-3 spreadsheet. The data represents the summary of the separate accounts of a single budgetary unit (library administration) and presents account balances as well as percentages of accounts unexpended. These percentages are easily compared with the "% of Year Remaining" figure, which is calculated from the current date each time the account is updated.

In order to track the expenditures for each account line, individual tables are set up at various locations within this spreadsheet; table locations are mapped so that they can be located readily for updating. In addition to the data elements that parallel the summary table (encumbrances, expenditures, balance), the individual account tables usually contain cells for invoice numbers, vendor names, date of purchase, date received, etc. It is also possible to use the date functions of the spreadsheet to "age" accounts and to program the table for automatic notification of outstanding purchases that might be of concern. The individual account tables can be printed out separately from the summary table to be used as status reports on the equipment budget, supply accounts, etc.

The general procedure for most libraries is to issue purchase orders or requisitions (for non-book purchases) to a central purchasing office and to notify that office when items have been received so payment can be processed. Accounts are accumulated and reports issued periodically, resulting in the library receiving outdated information. However, if every transaction is recorded in the appropriate spreadsheet table *before* it is forwarded, the microcomputer can be a means for providing the library immediate budget information that can enhance the budget manager's ability to make timely financial decisions. Because data entry into spreadsheets is quite simple, properly supervised clerks and student assistants can input most transactions.

Accounting for book and serial purchases is often done differently from accounting for other

purchases; the microcomputer can be especially helpful in keeping track of material fund expenditures. Book orders are often ordered directly by the library's acquisition department. As books are received their orders for payment are forwarded to central purchasing. This practice results in only "expended" and "balance" information being reflected on central accounting updates, usually for only one line called "Book Funds". Encumbered funds (outstanding orders) and the in-house re-allocation of the book funds (fiction, psychology, social science, women's studies) are usually tracked only by the acquisitions department. The spreadsheet is particularly useful in setting up numerous subaccounts in the book budget. Each book budget allocation can be maintained and monitored separately; year-to-year expenditures can be compared (individually or in aggregate) for purposes of reviewing levels of subject or program support (chemistry, young people's collection, humanities). Use of the microcomputer can provide daily fund balances that reflect not merely what has been spent, but also the amounts of individual book allocations that are left to be encumbered.

Efficient spreadsheets are designed so that data is only entered once into the individual accounts. The summary table is generally a series of spreadsheet formulas and functions that gather data from individual accounts and subaccounts and compute summary figures. In cases where additional figures are needed (year-to-date, monthly average, one year ago), historic tables can be established and macros designed to permit easy compilation of the data.

In general, spreadsheet design is a process of compartmentalization and aggregation. For ease of maintenance, accounts should be logically separated in a manner that reflects the library's assignment of fund responsibility; they should be summarized in a form that facilitates analysis.

"What If" Analysis

Many times financial managers are faced with questions like: "What if our revenue accounts are down six percent this year?" "What if we get a mid-year budget adjustment of five percent?", "What if twenty percent of our overseas book orders don't arrive before the end of the fiscal year?", or "What if all of the above?" In the past it has been quite cumbersome to "crank out" the multitude of budget calculations necessary to ascertain what effects such actions could have or how budget adjustments might be made in response to them. Because spreadsheet tables can be copied easily, data can be changed at almost any point in a table and balances calculated

immediately. The spreadsheet presents an efficient way to test various scenarios that are raised by what-if questions.

A variation of the what-if question is the "How can I" question: "How can I allocate a fixed sum of pay raise money to 120 staff, taking into account merit differentials?" The computing capability of the microcomputer and the ease of programming and copying formula changes make tasks such as this manageable. A supervisor can test and re-test various percentage assumptions until an optimum distribution is reached.

In addition to computing power, *1-2-3* also provides a graphing capability that can be useful in what-if analysis. Line and bar graphs are easily constructed from tabular information. Plotting several what-if scenarios on the same graph often makes possible trends and outcomes more understandable and can be an aid in the decision-making process.

Summary

Library financial managers need the budgets for which they are responsible to be maintained in an accurate and timely manner. In the past, they have often been dependent on offices outside of the library to provide them with updated budget information.

The combination of microcomputer and spreadsheet software now provide a tool that permits in-house establishment of budget accounts that can be easily and inexpensively maintained. Line item allocations can be subdivided into accounts that reflect the library's assignment of fund responsibility. Spreadsheets provide quick analytical calculations that can aid the financial manager in making budgeting decisions. Most importantly, the library's microcomputer can furnish updated budget information on demand. The immediate in-house access to this information can give financial managers a control of their budgets not provided by the periodic reporting of central budget offices.

References

1. Monica Ertel, "Micros for Productivity: Where Will We Stand Tomorrow?" in Nancy Melin Nelson (Ed.), *Connecting With Technology 1988: Microcomputers in Libraries* (Westport, CT: Meckler Corporation, 1988), 7.
2. In Philip M. Clark, *Microcomputer Spreadsheet Models for Libraries*, (Chicago: American Library Association, 1984), the author provides several VisiCalc models for library budgets as well as for other library operations.
3. At the LSU Libraries, a series of five *LOTUS 1-2-3* spreadsheets have been set up by Lorry Trotter (Accountant I) to account for the library's six million dollar budget. She has designed output tables that display data from individual budget lines (materials, administrative, etc.) as well as summary tables that use data from several distinct spreadsheets.



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