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AN AUTOMATED LIBRARY FINANCIAL MANAGEMENT SYSTEM

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An Automated Library Financial Management System

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Abstract

Management's demand for immediate and accurate financial accountability prompted the development of a computerized library acquisition system for control of informational materials acquired at NASA Ames Research Center. The system monitors the acquisition and receipt of both library and individual researchers' orders and supplies detailed financial, statistical, and bibliographic information. The resulting financial accountability has enhanced the Library's credibility with Center Management and has permitted economic analysis with long-range planning and prudent use of the available budget. This paper details the system, its applicability for other libraries, and the future availability of its program.
Introduction

Ames Research Center is a field laboratory of the National Aeronautics and Space Administration where scientists and engineers, assisted by technicians and other supporting personnel, create new technology. Ames has two libraries with specialized collections that provide comprehensive reference and information retrieval services. The library Technical Processing Facility (TPF) provides acquisition and cataloging services for the collections of both libraries and is also responsible for the acquisition and accounting records for expenditures on published materials acquired for use in the laboratories and offices of individual researchers. In addition, the TPF staff acquires, distributes, and maintains the accounts for reprints of papers and articles written by Ames' researchers. Because dissemination of information about new technology developments is an integral part of the research programs at Ames, the publication rate is high. The number of reprints acquired at times equals the amount of publications purchased for use by the individual researchers.

To accommodate these various functions, a somewhat unusual library organization structure has evolved (Figure 1). All technical processing functions are provided by an on-site support services contractor, Technology Development Corporation (TDC). A computerized acquisition control system has been developed by TDC and the Ames Computer Center to meet the needs of Ames' management for on-the-spot accounting of all expenditures of the various research groups within the organization. The reports generated by the TPF provide input to an accounting system, used through Ames, that tracks organization-related expenditures.
Although it is customary that a library be delegated responsibility for total publication acquisitions, it is unusual that it be assigned responsibility for budgetary control over other departments. The library at Ames acts as a controller over the publication budgets for all the Directorates. Frequent, periodic accounting of publication expenditures and budgetary status by organizational unit, which can be related to specific projects, is required.

Credibility in today's business environment rests heavily on the ability of the library manager to track rising costs, to accurately forecast publication market trends, and to report the effects those trends will have on the libraries future budget needs. Using such information wisely in planning necessary expenditures and making the reductions required by rising costs is one part of the manager's responsibility. Another of his major responsibilities is keeping administrators informed of cost and other problems associated with providing the collections and services necessary for the continued research development. Providing financial management with current and accurate accounting information that relates to the accounting systems in operation throughout the organization is a direct and effective means of communication.

Before the library financial management system was developed at Ames, it was difficult for the library to provide anything better than a rough approximation of the status of its accounts; ascertaining the total amount of outstanding or open orders was virtually impossible. To supply even those approximations required a complete shutdown of ordering and the work of at least three staff members for several days. Obviously,
the inaccuracy of the data and the delays that were incurred were received unfavorably by management and were disruptive of library routines.

System Development

The need for the development of a computerized acquisition system was evident and the decision to program it to be compatible with the general accounting system was wise. Ideally, the flexibility of an interactive on-line system would have been preferable because it would have offered more possibility for interfacing with the cataloging and public service functions. However, such a system would not have been possible for a number of years; because the developmental costs of the present system were quite low, the decision was made to proceed with its implementation.

The following areas were given priority in selecting criteria for system development. The system should:

1. Accommodate the data elements necessary to create the bibliographic and financial record.
2. Be programmed for flexibility so that access by any data element or field would be possible.
3. Be compatible with the general accounting system. Lighten the burden of manual recordkeeping.

Financial information was entered first because financial accountability was the most pressing need. When the financial information had been entered and verified and the programs were operating reliably, the bibliographic information was added. Once this second phase was operating well, additional changes to the programs were made to obtain more
meaningful information and to streamline operations. The data trans-
mittal forms were then revised to add other data elements that were
needed.

This gradual implementation schedule gave the staff of TPF time
to become acquainted with each phase of the project before further
changes were made. We believe that this approach minimized some of the
adjustment problems that frequently accompany the transition to an
automated system.

Entering the Data

The acquisition staff enters data into the system on in-house data
transmittal sheets that are processed by batch mode. The transmittal
sheets are color coded for "New Order," "Receivals," and "Adjustments"
(Figure 2). The TPF staff completes the data transmittal sheets on a daily
basis as materials are ordered and received or as adjustments are made. The
sheets may be taken to keypunching on a daily or weekly basis. All keypunch-
ing and error corrections are made by personnel at Ames' Computer Center.

Most of the data elements are filled in at the time the material is
ordered; included are bibliographic and order information. When the
material is received, additional information is added, such as price and
date received. Adjustments can be made to both open and closed orders.

For the usual processing schedule, data transmittal sheets are taken
to keypunching once a week. The cards are keypunched and a preliminary
run is made on the same night. If there are errors in the run, correc-
tions are made the next day and a second run is made the following night.
If the processing schedule is unusually heavy (e.g., at journal renewal
The keypunching can be done each day. The turnaround time between submitting the data and the final reports is three working days.

The system has a number of built-in error conditions that prevent the most commonly made errors. A partial list of error conditions follows:

- Invalid date
- Fiscal year log not unique
- Invalid item type
- Invalid quantity
- Invalid estimated cost
- Invalid payment type
- Invalid organizational code
- Quantity results in a minus
- Invalid transaction, order completed
- Invalid action code
- Quantity received exceeds quantity
- Cost not within 30% ± estimated cost
- Invalid organizational code
- Invalid vendor
- Quantity results in a minus
- Invalid action code

The presence of these error conditions and the validation against organizational code and vendor code tables automatically causes an error message to print; a remarkably clean file is the result.

Reports

The system automatically produces the following reports at the end of the weekly, biweekly, and monthly cycles.

Library Materials Acquisition Log (Master File): At the end of every other biweekly period, or about once a month, the Computer Center produces a master record of all transactions to date. The report is arranged numerically by fiscal year and purchase order number and shows the status of all open and closed orders. The acquisition staff keeps a copy in the TPF area as the master record and the reference staff uses a second copy in the public service area for use in answering inquiries about orders (Figure 3).
Packet report: Copies of the invoices and this report which lists and totals the invoices are submitted to Ames for reimbursement. The accompanying Packet Report provides a list of those items treated in the invoice packet. The entries are arranged alphabetically by vendor, numerically by invoice number within each vendor, and numerically by purchase order number within each invoice. Credit memos and returned checks are interfiled with invoices but show a minus dollar amount to indicate that money has been returned. Subtotals by invoice and by vendor act as a cross check for invoice accuracy and as an aid in the check writing process. This report also includes a summary sheet that itemizes expenditures by job order account number (Figure 4).

Biweekly Report: All transactions made in a biweekly period are shown and summarized in a biweekly financial accounting report. This summary tracks the estimated dollar amount for outstanding orders and the total actual expenditures for received orders in both the previous years and the present budget year. This report is then fed into the general accounting system (Figures 5 and 6).

Monthly Report: This is a financial accounting by individual organizational unit. It indicates expenditures by type of material and enables the researchers to relate the cost of library materials and publications to projects (Figure 7).

Special Reports: At the end of the fiscal and calendar years, it is often useful to gather data that reflect the level of effort during the year. Through mini-programs designed upon request, the system allows us to collect information such as the following:
1. Vendor reports that show the number of orders and dollars spent with each vendor as well as turnaround time between order and receipt dates.

2. Journal subscription reports that list all journal orders alphabetically by title with both estimated and actual costs. This allows us to measure journal price increases from year to year and to evaluate the validity of our estimates.

3. Average price by item type reports that give a total and an average of our yearly expenditures by type of material.

These few examples of special reports we have requested in the past are representative of the versatility of an automated system in manipulating data and providing additional reports as the need arises. Figure 8 is a flow chart of the acquisitions and accounting processes.

Conclusions

All departments of the Technical Processing Facility and some of the public service functions have benefited from implementation of the automated system. The establishment of processing schedules and deadlines that affected both Cataloging and the Serials Department has greatly improved the overall workflow.

Elimination of the manual log, which contained most of the information transferred into the new system, was the most celebrated event. The log was arranged numerically by purchase order number and took up seven large and cumbersome ledgers. The log was the only source from which statistical and financial reports could be compiled and the compilation required hours.

Use of an automated system required standardization of forms and standard arrangement of the manual files. The improvement in the accuracy
of acquisitions records has resulted in better service to library users through faster claiming and reordering, and because of fewer conflicts with invoicing and returned materials. In addition to these technical improvements, the improved financial accountability has enhanced the library's credibility with management and has facilitated economic analyses for long-range planning and prudent use of the available budget.

The system was programmed to meet the specific needs of the Ames Research Center Library and its value to Ames has been proved. Application has been made by the Computer Center for the program to be made available through COSMIC if other librarians are interested.
Figure 1. Organizational Structure.
Figure 2. Data Transmittal Forms.
Figure 5. Biweekly Report.
Figure 6. Biweekly Financial Summary.
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Figure 7. Monthly Report.
Figure 8. Flow Chart of the Acquisition and Accounting Processes.