Automation of the Public Library: Cost Implications for the Library Budget

Dale Gaddis

When one addresses the question of budgetary implications of automated systems, it is very tempting to get into a full discussion of the whole process of planning, procurement, conversion, implementation, and operation, since costs are dependent on the choices made throughout this process and the choices made are often dependent on the costs. I have not had much success in avoiding this temptation, but I hope that the information I have included can be used as a practical guide for budget planning and decision making as a library automates its functions.

Public libraries in North Carolina have approached automation in various ways, including:

- Turnkey minicomputer-based integrated library systems, with a computer housed in the library, a dedicated library computer housed in the county or city data processing headquarters, or a shared county or city computer;
- Online commercial circulation systems using supermicros or local minicomputers connected to vendor mainframes;
- Microcomputer-based circulation systems;
- Online public access catalogs as part of integrated systems;
- CD-ROM public access catalogs;
- Automated cataloging using OCLC;
- Automated cataloging using CD-ROM systems;
- Systems developed in-house for patron registration, overdues control, etc.

However, the majority of public libraries in the state have no automated library functions at all.

In an attempt to broaden the scope of this article beyond my own experience with a turnkey minicomputer-based integrated library system, I surveyed public libraries in the state which I had identified as having automated functions. In the survey, I sought information on the types and sizes of systems installed; procurement procedures and problems; and the costs of the systems, their implementation, and their continuing operation.

Although I felt that a comparison of system costs would be interesting, I predicted that cost information would not be easily retrieved nor easily compared. Responses to survey questions proved this assessment to be correct and I do not attempt to provide such a comparison in this article.

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Planning for Automation

There is great concern among public librarians that once a library is automated, other budget areas will be adversely affected because of funds required to keep the system operational. Public libraries in North Carolina have not been automated long enough to test whether this concern is in fact valid. Certainly, before automating a library, it should be determined that benefits to be gained by automating are of sufficient value to warrant the funds to be invested, and that, by investing the funds for this purpose, other aspects of library operation with equal or higher value will not be sacrificed.

It is absolutely required, therefore, that thorough planning precede any decision to automate. Not only will planning help to prevent future unwanted drifting of budget priorities, but it could also reduce significantly the cost of automation. Decision makers need to have a good idea of what the future holds for library services in the community served. A service development plan should be in place which is based on solid information regarding demographic, social, and economic trends in the community, and which includes projections of library use, collection size, and number of registered patrons. Functions to be considered for automating and benefits to be gained should be identified.

The five-year budgetary impact of automating, in light of the functions required and the benefits to be gained from the system, should be compared with the budgetary impact of performing the functions and achieving the benefits using

a manual system. This cost study will help to determine whether the library should automate and, if so, which functions and what growth requirements will be needed. This analysis also may be required before any funding authority will underwrite the purchase of a system.

Budgetary considerations must be assessed for the planning process itself, including consultant costs, if one is used, and a significant amount of staff time whether a consultant is used or not.

Funding for the System

Libraries in the state have used a variety of sources to fund automation. Most have been very dependent on local funds, but with supplements from federal and state sources. Over the years the State Library has supported automation projects with consultative support from its staff and with LSCA funds for feasibility studies and major automation project grants. (Now that the majority of large public libraries in the state have automated, there has been talk that the major automation grant funds may be allocated differently.) Libraries have also used their state allocations and funds from LSCA enrichment grants to supplement local appropriations. Other sources mentioned in the survey were foundation grants and gifts.

System Procurement

If the feasibility planning for the system has been done thoroughly, much of the information needed for the procurement process will have been gathered. Before going out for bid for any size system, it is necessary to know exactly what the system will be required to do. Getting this information into a format for bidding, identifying potential vendors, preparing the bid advertisements, conducting a bidders' conference, and evaluating the bids normally requires outside assistance. This assistance needs to be included in the library's budget and will vary in cost depending on the amount of expertise available on the library's staff and in the county's or city's finance, data processing, and legal departments.

Request-for-Bid Proposal Preparation

Information needed for the request for bid proposals (RFP) includes processes to be automated and how they are to function, the projected size of the data base, activity to be accommodated by the system with growth projections included, and the number of peripherals to be required. The growth potential of the system will affect future costs, so these projections should be very carefully considered.

In addition to consultant assistance in the process of developing the RFP, significant secretarial time is needed for typing and copying the RFP for distribution. The document may be very long, depending on the complexity of the system; and since it may be revised several times, it can be costly to type and reproduce. If a consultant is used for the development of the RFP, the preparation of the final document may be part of the services provided.

Bidding Process

Costs incurred by the library during the bidding process will depend on whether or not the county or municipal purchasing office plays a role. Costs are still there, of course, regardless of who assumes them.

Advertisements need to be prepared, RFPs copied for the number of vendors requiring them, and postage allocated for mailing the documents to the vendors. Express mail may be required depending on the time involved.

If the library holds a bidders' conference, costs incurred by the library and/or purchasing office are mainly time in the conference, including consultant time and expenses, and the preparation and mailing of addenda.

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Bid Evaluation

The bid evaluation process is extremely costly in staff and consultant time, and should involve the government purchasing and data processing staffs to ensure their concurrence with decisions made. The bid evaluation often includes visits and calls to installation sites and attendance at users group meetings. Travel costs and long distance calls should be included in the budget to accommodate these needs.

North Carolina statutes require that local governments accept the lowest *responsible* bid. Of the libraries who responded to the survey and were required to bid out their sytems, four out of five did not accept the low bid. In all cases, the systems did not meet specifications or evaluation criteria as stated in the RFP. Charlotte-Mecklenburg set as its evaluation criterion "the optimum combination of functionality, hardware configuration, software design, delivery, approach to

migration from Dataphase system, five year cost, and vendor viability/past performance." Selection was based on this criterion, not on the lowest price bid. In Durham we were using a similar evaluation method, and discovered that the low bidder clearly did not meet the specifications as stated for a major function we required.

In many local situations, the lowest bid can appeal to funding authorities, whether or not specifications are met. Extra effort is required to convince them that the low bid will not accommodate the needs of the local situation. In explaining how not selecting the low bid was justified to funding authorities, one library responding to the survey stated: "With lots of charm." In Durham, charm might also have been a factor, but it helped to have had the data processing and purchasing staffs involved throughout the bid evaluation process and in agreement with the recommendation being made to the Commissioners. Three of the libraries who responded to the survey were using county computers and thus were limited by the available hardware in the systems they could consider. This situation simplifies the selection process and works to the library's advantage if the system which runs on the local computer is also the best functional selection for the library.

Contract Negotiation

Contract negotiation may require the presence of the consultant and will require the time of an attorney and the purchasing agent. The amount of time is dependent on the number of changes which will be required from the RFP and whether or not a standard contract can be used.

At contract signing, the vendor may be required to submit a performance bond. The cost of the bond is often included in the price of the system bid.

The library or funding agent may choose to purchase the system outright, to lease the system, or to purchase the system through a lease/purchase arrangement. Leasing and lease/purchase arrangements involve less initial outlay of funds, but cost more over an extended period. In addition, lease and lease/purchase arrangements may require dealing with a third party. North Carolina statutes regarding lease/purchase arrangements are relatively complicated.

System Costs

Hardware costs are determined by taking into consideration the library's requirements for the following components and services:

- *Central processing unit.* Several of the libraries responding to the survey use the local government's computer for their applications. This is one way for the system cost to be less; however, the libraries may end up competing for computer space with other departments of the government. In one situation, the county computer had to be upgraded. In another, during the time that it took for the library to build its data base, other departments took all the space that was available in the county computer. This resulted in the unexpected need for a stand-alone system.
- *Disc and/or tape storage/drives.*
- *Printers.*
- *Terminals*, for staff and patron access.
- *Wands or laser readers.* Wands are less expensive, but laser readers may be required in busy locations.
- *Interfaces to other systems.*
- *Freight and Installation.* Installation costs can be saved if county or municipal data processing staff is available to perform some or all of this task. In Durham, the vendor installed the central site hardware; the county installed all peripherals. However, if there is any concern that the vendor will not provide support for equipment installed by local staff, these will be false savings.
- *Maintenance.* The number of hours, the days of the week, and the response time required will affect the cost of maintenance, as will the requirement for on-site maintenance versus off-site. If the maintenance contract calls for off-site maintenance, the budget should accommodate shipping costs and the need for replacement equipment.
- *Furniture to house equipment* (terminal tables, chairs, printer stands).

Software costs will include the costs of the operating system and the application programs or modules. Maintenance costs again are dependent on the hours, days of the week, and response time required from the vendor. Software costs may also include the price of customizing to accommodate local conditions. In turnkey systems, the profiling of the system to meet local policy requirements is usually included in contracted costs. Changes to the profile after a period normally included in the contract will cost extra, usually on a per-hour basis. If the system is developed in-house, in-house expertise is required as well as the time to develop the system.

Communications devices are required if any remote stations are to be established or if the sys-

tem is linked in any way to a mainframe in another location. The library needs to plan for the purchase of modems and/or multiplexors, depending on the number of terminals to be accommodated. One such device is needed at each end of the telecommunications line. Telecommunications lines, either dedicated or dial-access depending on use, are also required and represent an ongoing cost of the system. Other methods of establishing communication links are available, including data radios. The initial cost of data radios is relatively high, but there are no ongoing telecommunications costs. These instruments do not work in all locations, however.

Backup systems should also be considered in the budgeting process. When the system goes down, how the library is to circulate materials or have access to the catalog are important considerations. Circulation backup systems include inexpensive legal pads for recording barcode numbers or the more expensive microcomputer workstation or portable reader. Backup for a computer catalog may include a microfilm or fiche catalog or a CD-ROM catalog, the latter being the more expensive alternative.

Site Preparation

Site preparation can be a major cost consideration in planning for library automation. Depending on the type of system chosen, the following could be required:

- *Space.* If the system to be installed is a turnkey, minicomputer based system, space is a prime consideration. The amount of room required is very dependent on the type of system chosen and could affect the cost comparisons of the system bid.
- *Air conditioning.*
- *Raised floor.*
- *Dedicated electrical power.*
- *Power protection.*
- *Fire extinguishing system.*
- *Grounded electrical outlets* for all peripherals.
- *Individual surge protectors, anti-static mats, and cleaning kits* for terminals.
- *Cabling* throughout building.

Several of the libraries responding to the survey have their computers housed in the county computer room or use the county computer. Major site preparation costs are saved by doing this; however, it is possible that the room will need to be enlarged or rearranged and electrical and air conditioning systems upgraded if equipment is added.

Conversion Costs

Bibliographic. Conversion of the bibliographic data base may represent the greatest cost in automating a library system. This will depend on whether machine readable records are being created as part of the current cataloging process, and on the number of titles in the collection not in machine readable form. Cost elements to be considered in budgeting for the conversion include staff time, network or vendor costs, telecommunications costs, and equipment costs. Once the conversion is completed, a computer tape of the data base must be profiled and processed for loading into the local system. Once loaded, the records need to be indexed.

Copy-level Conversion and Barcoding. Copy-level conversion can be accomplished at the same time as title conversion (described above), depending on the method chosen for automated cataloging. In Durham, we did not do this for two reasons: lack of access to our records on OCLC to make changes when copies were added or removed, and the length of time it was projected to complete the retrospective conversion. As a result, it was necessary once the data base was loaded in-house to add the copy information to all of the titles. This involved hiring temporary staff for a four-month conversion project.

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Barcoding of the collection can be done at the same time that the copy information is being added to the data base, or it can be done as a separate project by generating smart bar codes from a tape of the data base. Costs involved include the barcode production and a substantial amount of staff time to plan the project, to place the labels in the materials, to clean up the data base at the completion of the project, and to deal with problem items which turn up regardless of the quality of the conversion effort.

Patron Conversion. Creating the patron data base is also costly in staff time and as much of it as possible should be completed before the system is brought up. Budgetary considerations include the possibility of using temporary staff, barcode

purchase, printing of new patron registration forms, and the cost of new borrowers' cards.

Implementation Costs

Planning. An extraordinary amount of staff time goes into the implementation of the automated system, even beyond the data base conversion efforts described above. Library policies and procedures must be reviewed for changes required or made possible by the new system, and the new system must be profiled to reflect these local policies. Installation and all it entails must be coordinated with the vendor (and the local data processing department, if applicable).

Training. Initial training is normally included in the contract with the vendor. However, I think that most libraries have found that supplemental training is always required. This training may be done by staff, by contracting with the vendor for additional time, or through off-site workshops sponsored by the vendor or other sources. This followup training can involve substantial travel costs and/or registration fees, and a significant amount of staff time.

A training room is nice to have available so that several people can receive hands-on experience simultaneously. This requires terminals, cabling to the room to accommodate the terminals, and tables and chairs. Terminals that will be used later for circulation or as public access computers (PACs) can be used temporarily for training.

Training is needed not only on system functioning but also on the new policies and procedures implemented by the library as part of the automation process.

Publicity/Public Relations/Public Acceptance. One major aspect of any automation project is communicating the changes to the public. Staff time is needed to plan and coordinate public relations efforts. A printing budget is needed for producing brochures to publicize and orient the public to the new system and to new policies. Video and slide presentations may also be considered for publicity and orientation.

Staff Recognition. Computer implementation involves a tremendous effort from the staff over and above the daily demands of operating the library. Budgets should include funds to recognize that effort.

Ongoing Operational Costs

Hardware operation will require local staff to bring the system up and take it down, to do file saves, to troubleshoot problems particularly with peripherals and software operation, and to coordinate vendor maintenance. The amount of staff time required will depend on the type of system chosen and the amount of support available from local data processing staff.

Time will also be required to prepare documentation of hardware operations as they are handled locally, including emergency procedures, etc.; to perform whatever day-end processing might be required; and to generate reports and notices.

Most systems include software enhancements as part of the contract provisions. Although there may be no additional purchase cost involved for enhancements, they are costly in staff time to load on the system and to review for changes which will need to be communicated to the full staff.

The library will want to become a member of the users group for the system if there is one. Costs involved will include membership fees, travel costs, and staff time to attend meetings.

Resulting Budgetary Impact of Automation

Revenue Changes. Of the libraries responding to the survey, the effect on fine and fee revenues ranged from zero to fifty-nine percent. In Durham, fines have increased forty percent as a direct result of automation; payment for lost books has increased twenty-four percent. Unfortunately, Durham County required the library to increase fines four months after automating, so a valid comparison of fine revenues could only be made for two months. With our new fine structure, our revenues have increased more than eighty percent.

Personnel. I have attempted to outline above the new duties that are required as a result of automation and the enormous amount of staff time involved in the conversion and implementation process. The major effect on personnel following implementation is, of course, on the number of manual tasks that no longer must be performed—no catalog cards to be filed or pulled, no overdue notices to type, no circulation files to put in order or to search for returned books, no shelf list to maintain, no registration card and cross reference files to be maintained.

Libraries surveyed cited the ability to use staff more flexibly than in the past and to accommodate substantial growth in library use without adding staff. New Hanover reports a 21 percent increase in circulation, a 212 percent increase in reserve activity, a 23 percent increase in patron registration, and a 26 percent increase

in reference activity. They have not had to add staff to accommodate this growth. Libraries reported that, as a result of automation, staff have been transferred out of technical services and circulation into other areas of the library.

To use staff more flexibly, however, does require hiring personnel with skills which can be used in various areas of the library. This affects classification and salary levels. Computer skills and more paraprofessional library skills will be needed if existing staff—released from the clerical tasks they previously performed—are to be used to upgrade or provide new services. As recruitment standards for positions change, success at recruitment may also be affected if the new skills required are not available in the local labor market.

Telephone and Postage. These two lines in the budget increase drastically the first year of operation under a new system. Telephone costs are affected by the number of lines required to remote sites, and may be even greater if the vendor does not have a toll free number.

Postage may be affected if the library has previously been unable to keep up with patron notices for overdues and holds. Prior to automation, the Durham Library was only sending overdue notices when items were six weeks overdue. With the computer system, we send notices after two weeks, and additional notices after six and twelve weeks.

Supplies. Automation may result in some savings on supplies. Catalog and book cards are eliminated. The number of borrower cards may be reduced if renewal is not required for regular patrons in good status. It may be possible to use less expensive patron cards than have been previously used.

There will most likely be an increase in the number of notices required, however. The cost of notices will depend on the type chosen, crash notices being more expensive but reducing staff time required to stuff envelopes. There will be a continuing need for barcodes, printer paper for reports and diagnostics, printer ribbons, and magnetic tape for file saves.

Utilities. None of the libraries surveyed mentioned the impact of automation on utility costs. With the central computer in Durham housed in the county data processing department and another department budgeting and paying our utility bills, it is very difficult to know our increase. It must be significant, however.

Equipment. The only savings in equipment costs resulting from automation are in card catalog and shelf list cabinets and in the old circulation equipment which are no longer needed.

There *is* ongoing maintenance required on the computer hardware and software; and once a system is installed, everyone wants his or her own terminal. This leads to the need to upgrade the system. The more terminals available, however, the more effectively the system can be utilized.

Materials Budget. Depending on the level of automation, the library may be able to make much more effective use of its materials budget. Collection development can become more focused towards user needs. Use statistics may be available for individual titles and copies; purchase alerts may be generated for materials in high demand; and printouts may document materials not circulating. Much better control is gained over the collection. We know where materials are and can retrieve them without having to add copies throughout the system to meet occasional demand.

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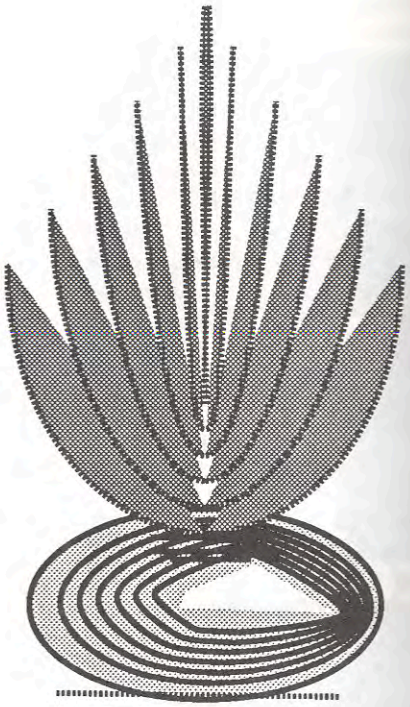
System Upgrade. Among libraries surveyed, one important consideration in determining the budgetary impact of an automated system is the need to upgrade the system. This was cited by several respondents as an unexpected cost. Adding just five more terminals to a system, if it is not designed to accommodate them, could require a new port board, additional memory in the CPU, additional disc storage, an additional processor, or even a new system altogether.

An upgrade will eventually be required in any library situation where there is growth in patron and/or staff use, where additional functions are desired on the system, or where there is growth in the data base to be accommodated. In initial planning, it is wise to project growth and type of use for at least five years, and to make sure that even if the system purchased does not accommodate the growth with the initial configuration that it can be expanded at a reasonable cost and with little disruption to existing operations. It is also wise to be liberal in the estimation of growth, because once the library is dependent on an automated system, demands for access to the system from both staff and patrons multiply rapidly. Funds should be budgeted annually, if possible, to be reserved for system upgrade.

Summary

The automation of a public library will have a major impact on the library's budget. The highest costs are in the early stages of automation, during the planning and implementation phases. Even spreading the costs out over five years requires a financial increase. However, if one were to estimate the cost of maintaining with manual systems the services and collection control made possible by automation, it is likely that the costs would exceed the budgetary limits of most libraries. Once one enters the world of automation, it is extremely difficult to turn back. Careful planning is therefore required to prevent a cutback in traditional services which might be made necessary by the increasing budgetary demands of a system which was originally implemented to enhance those services.



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