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ABSTRACT

This workbook presents outlines of topics to be covered during a two-day workshop on the fundamentals for library automation. Topics for the first day include: (1) Introduction; (2) Computer Technology--A Historical Overview; (3) Evolution of Library Automation; (4) Computer Hardware Technology--An Introduction; (5) Computer Software Technology--An Introduction; (6) Data Processing Organization and Management; (7) Library Automation Standards and Protocols; (8) Types of Library Automation; (9) Evolution of the Integrated Library System; (10) Library Automation Project Planning--An Introduction; (11) Library Automation Budgeting--An Introduction; and (12) Data Conversion--An Introduction. Topics for the second day include: (1) The Library Automation Marketplace; (2) Planning for Individual and Cooperative Library Automation Projects; (3) Vendor Proposal Evaluation Worksheets; (4) Documenting the Costs of Automated Systems; (5) Automation Project Budget Worksheets; (6) Example Contract Language (Purchase/Maintenance); (7) Tests--Evaluating the OPAC (Online Public Access Catalog); (8) Example System Performance Examinations; (9) Remedies--What to Do When the OPAC Fails the Test; (10) OPAC Research--What We Have Learned; and (11) Determining the Number of OPAC Terminals. The text is supplemented with several illustrations and graphs, and sample forms are provided. (KM)

FUNDAMENTALS OF LIBRARY AUTOMATION AND TECHNOLOGY

Participant Workbook

A Workshop Presented By

Frank Bridge and Robert Walton

of the

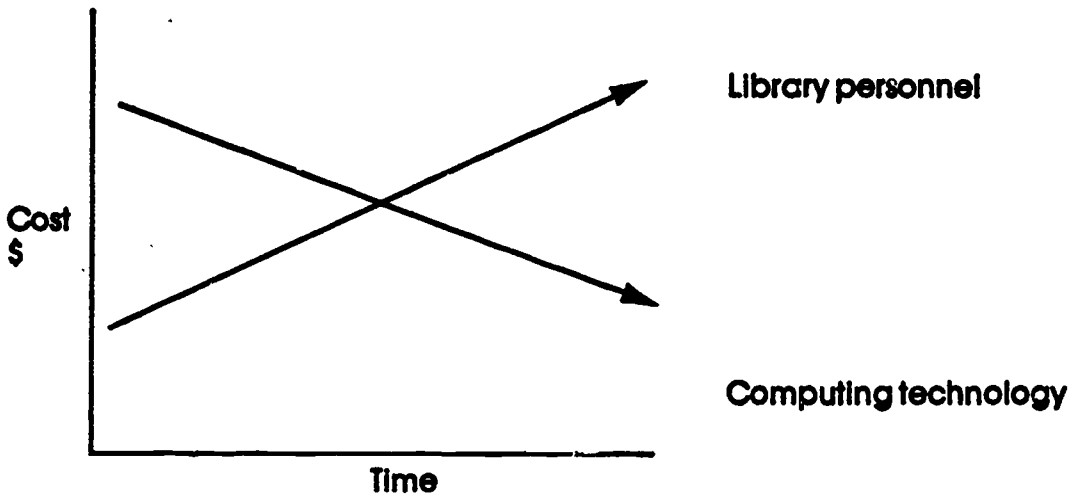
Library Development Division
TEXAS STATE LIBRARY

April 1987

Topics for Day 1

INTRODUCTION

- Library Automation -- or -- Library Mechanization.



- Themes of library automation:
  - Recognizing and assessing appropriate technology
  - Investigating and planning for technology
  - Selecting and implementing technology
  - Managing technology
  - Technology and its impact on the profession

Computer Technology: A Historical Overview

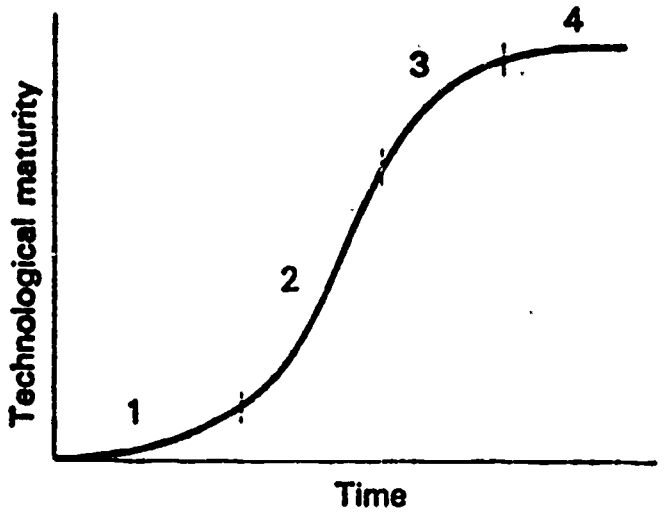
- First Generation [Vacuum tubes]
  - Atanasoff-Berry computer [1939-1942]
  - ENIAC [1943-1946]
  - EDVAC [1946-1952]
  - UNIVAC [1951]
  - IBM 701 [1953] and IBM 650 [1954]

- Second Generation [Transistors/solid state]
  - IBM dominated market
  - IBM 1401 [business computer]
  - IBM 1620 [scientific computer]

- Third Generation [Integrated circuits]
  - Growth of computer industry
  - Growth of peripheral industry
  - Growth of telecommunications industry

- Fourth Generation [LSI and VLSI]
  - Super computers [Cray]
  - Computers now a part of all government, business and industry.

- What comes next ?
  - Artificial intelligence
  - Expert systems
  - Increased miniaturization
  - Increased storage
  - Increased cost/performance



Gibson and Nolan growth stages	McFarlan and McKenney technological use
1. Initiation	1. Technological identification and innovation
2. Contagion	2. Technological learning and adaptation
3. Control	3. Rationalization/ and management control
4. Maturity	3. Maturity widespread technology transfer

Evolution of Library Automation

- Early Library Automation Efforts (1950s)

- Unit record systems

- Montclair System

- Growth of automated technical services
  - Acquisitions
  - Serials
  - Cataloging

- Offline Computer Applications (1960s)

- ☐ Library of Congress and the MARC Format

- ☐ Growth of the Bibliographic Utilities
  - ◇ OCLC
  - ◇ RLG
  - ◇ WLN
  - ◇ UTLAS

- ☐ Growth of the Commercial Online Systems

Computer Hardware Technology: An Introduction

- Types of Computer Systems
  - Mainframe
  - Super-Minicomputer
  - Minicomputer
  - Microcomputer

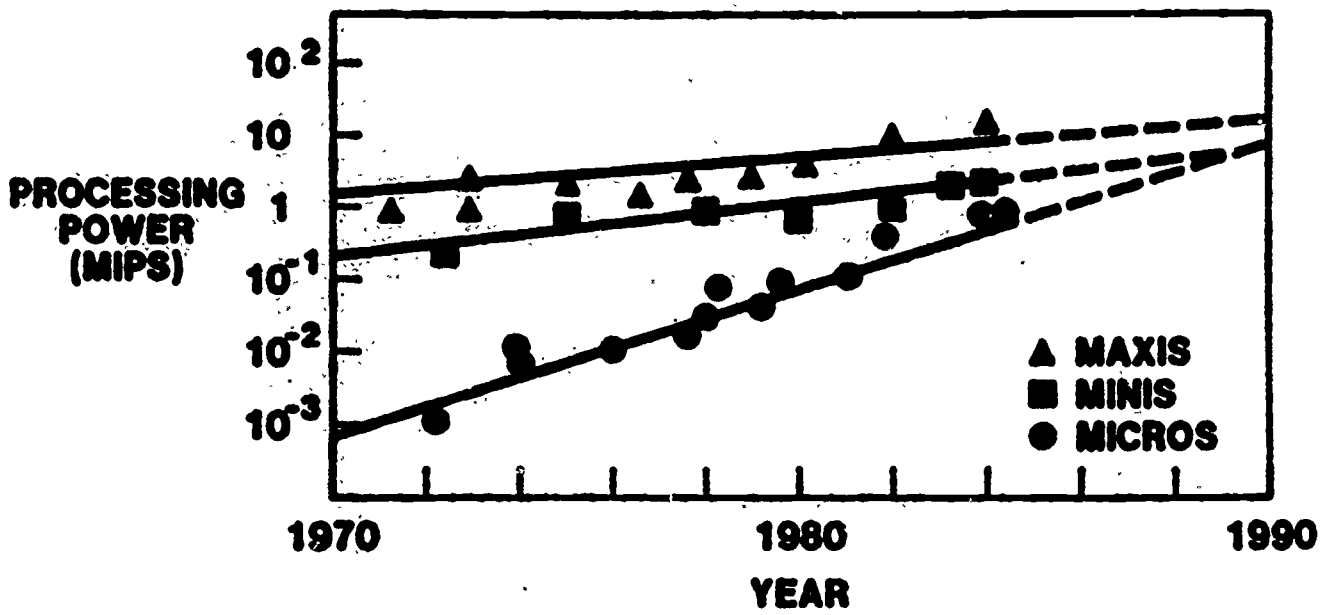
- Types of Computer Organization
  - Single system
  - Multiple system
  - Distributed system
  - Local area network [LAN]

- Components of the Computer System
  - CPU
  - Operator Console
  - Main Memory

- ◇ Tape Drive Systems
- ◇ Disk Drive Systems
- ◇ Terminals/controller
- ◇ Line Printer/controller
- ◇ Tele/data communications
- ◇ Other computer components

☐ The Special Computer Environment

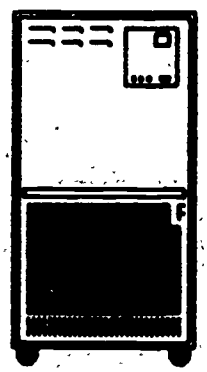
- ◇ Computer Room
- ◇ Electrical
- ◇ Air flow and temperature
- ◇ Humidity
- ◇ Security
- ◇ Special warning systems
- ◇ Other special requirements



Source: AT&T Bell Laboratories.

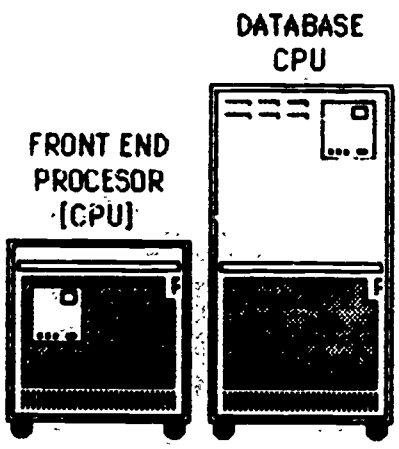
TRADITIONAL HARDWARE/SOFTWARE ARCHITECTURES

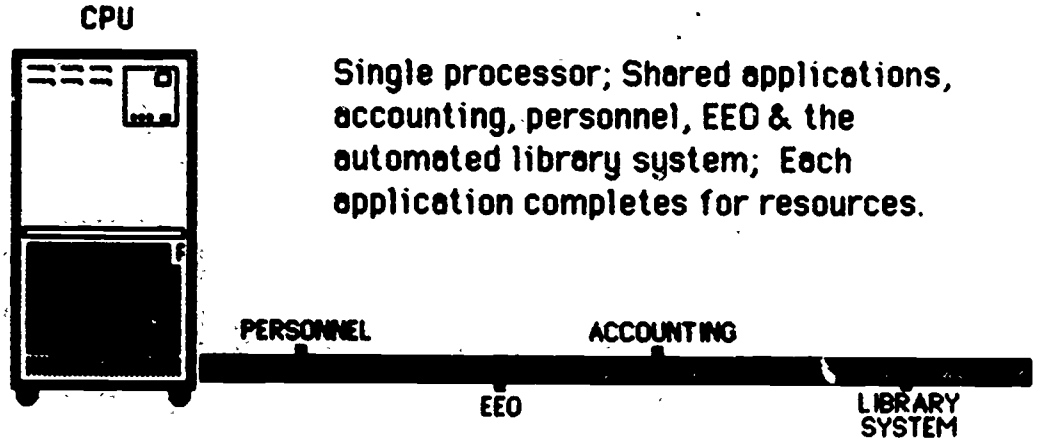
CPU



Single computer processor;
Dedicated to the automated library system.

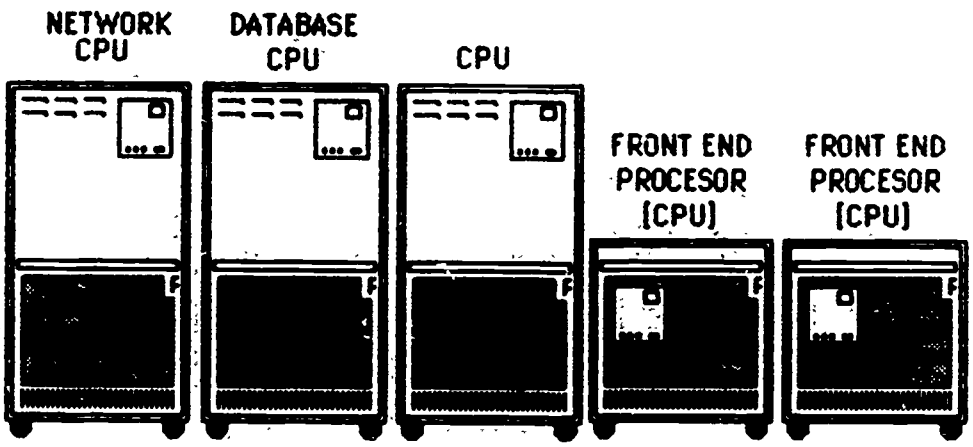
Database processor, connected to front-end processors;
Dedicated to the automated library system.



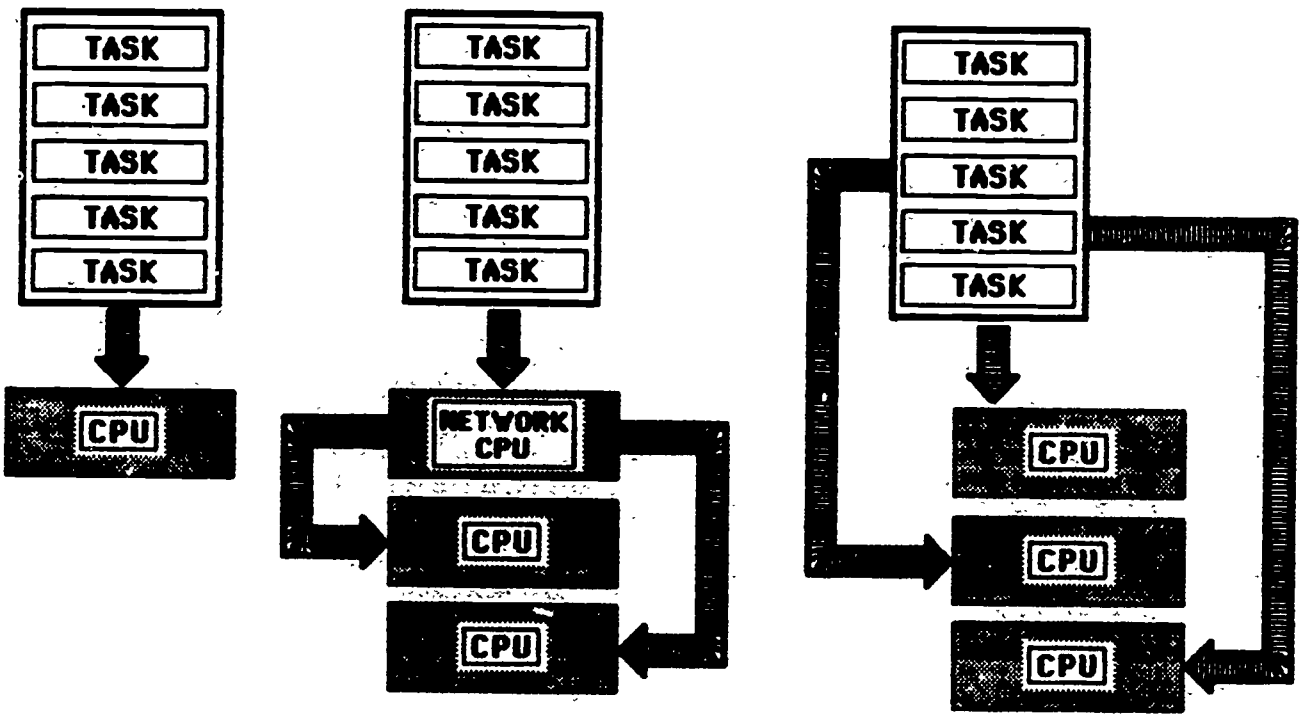

CPU
Single processor; Shared applications, accounting, personnel, EEO & the automated library system; Each application completes for resources.
PERSONNEL
ACCOUNTING
EEO
LIBRARY SYSTEM

EMERGING HARDWARE/SOFTWARE ARCHITECTURES

Multiple processor, networked system; fault tolerant processing and database storage.



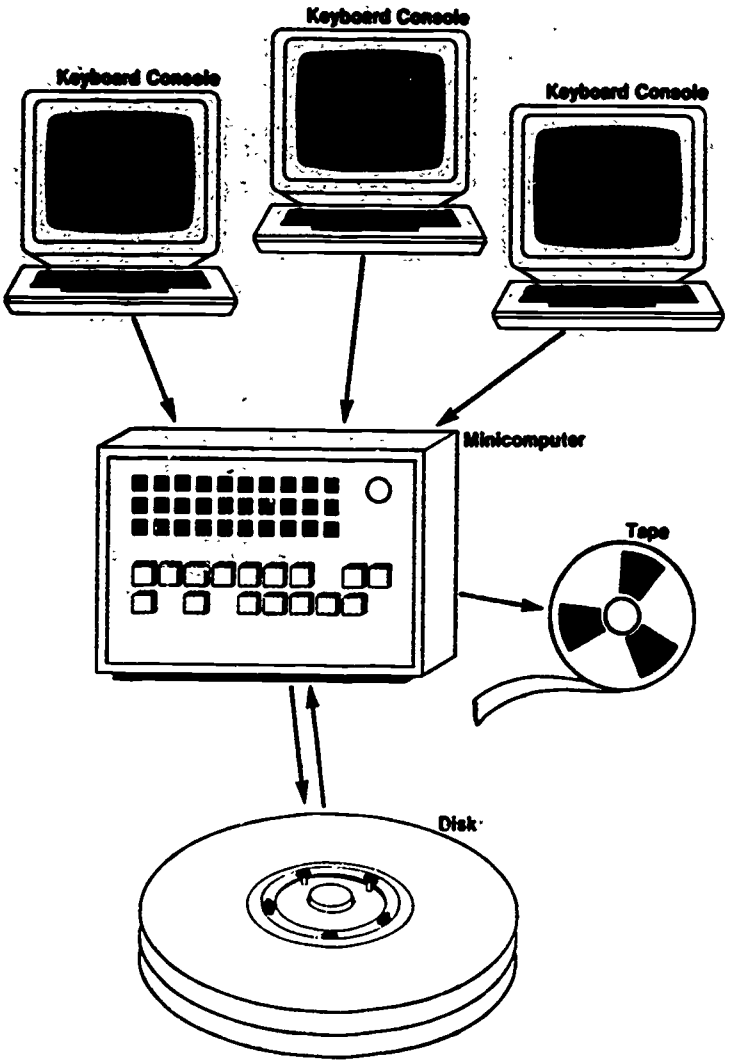
Multiple processor, networked system -- using parallel processing.

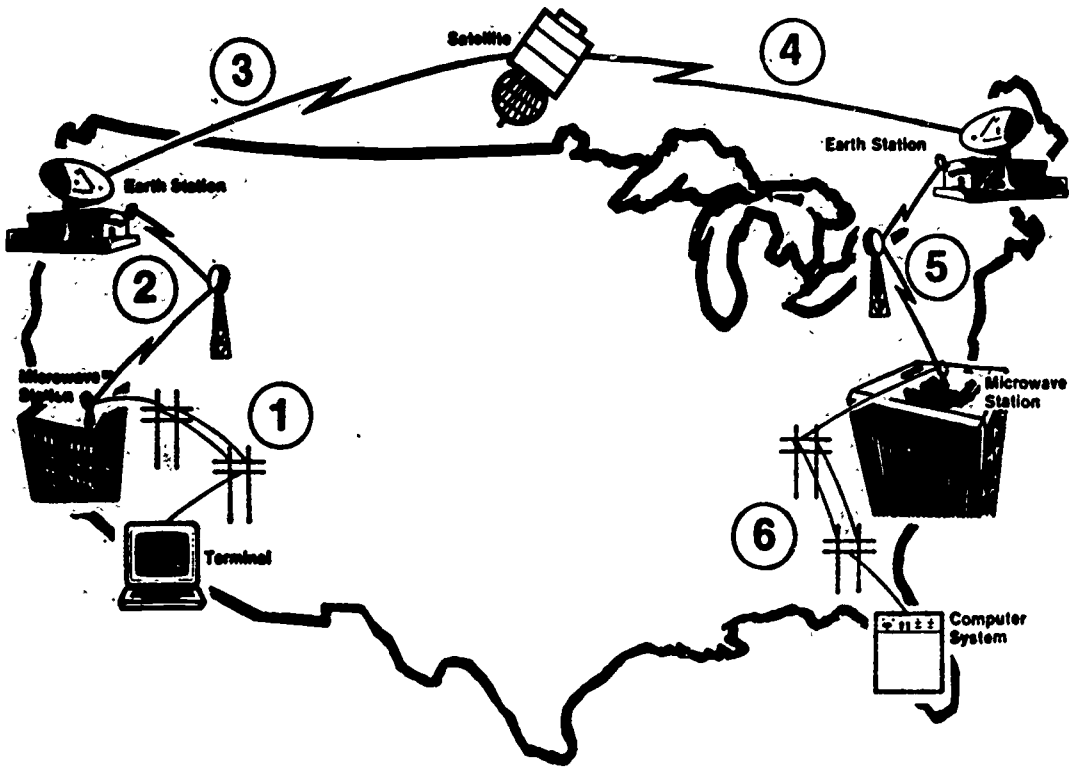


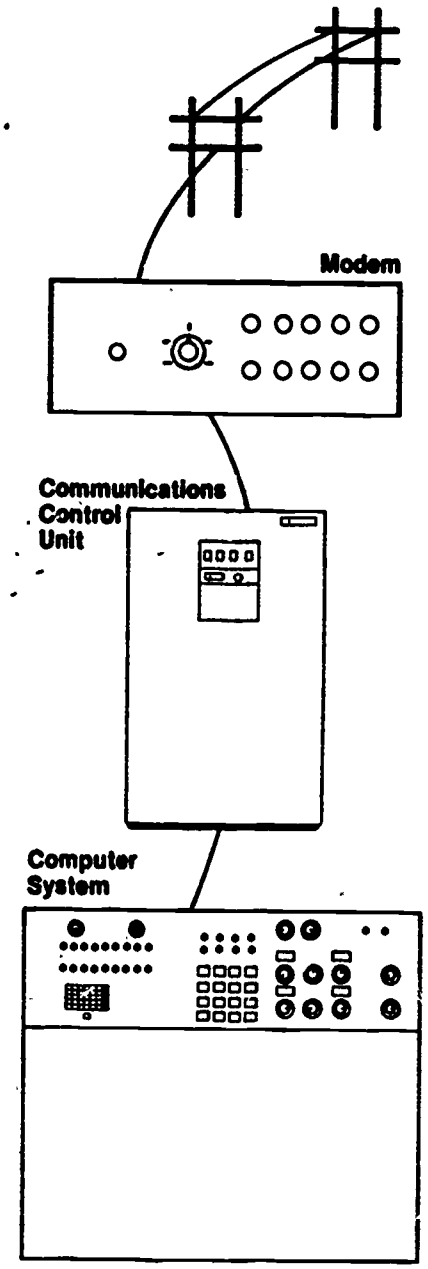
Uni-processor

Traditional network multiprocessor

Multiprocessor parallel processing


Keyboard Console
Keyboard Console
Keyboard Console
Minicomputer
Tape
Disk


Satellite
3
4
Earth Station
Earth Station
2
5
Microwave Station
1
Microwave Station
Terminal
6
Computer System


Modem
Communications
Control
Unit
Computer
System

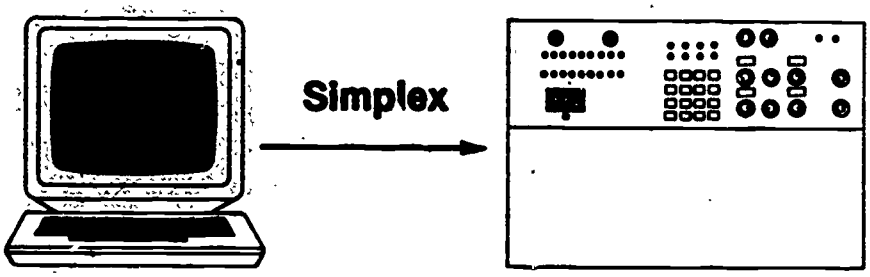


Figure 8-15

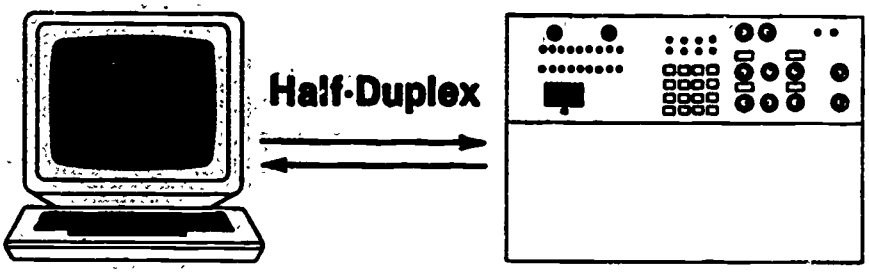
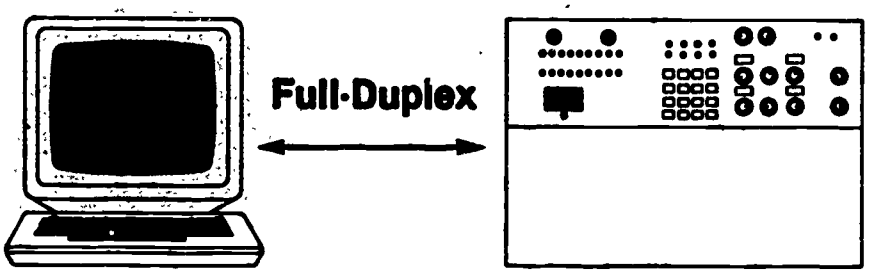
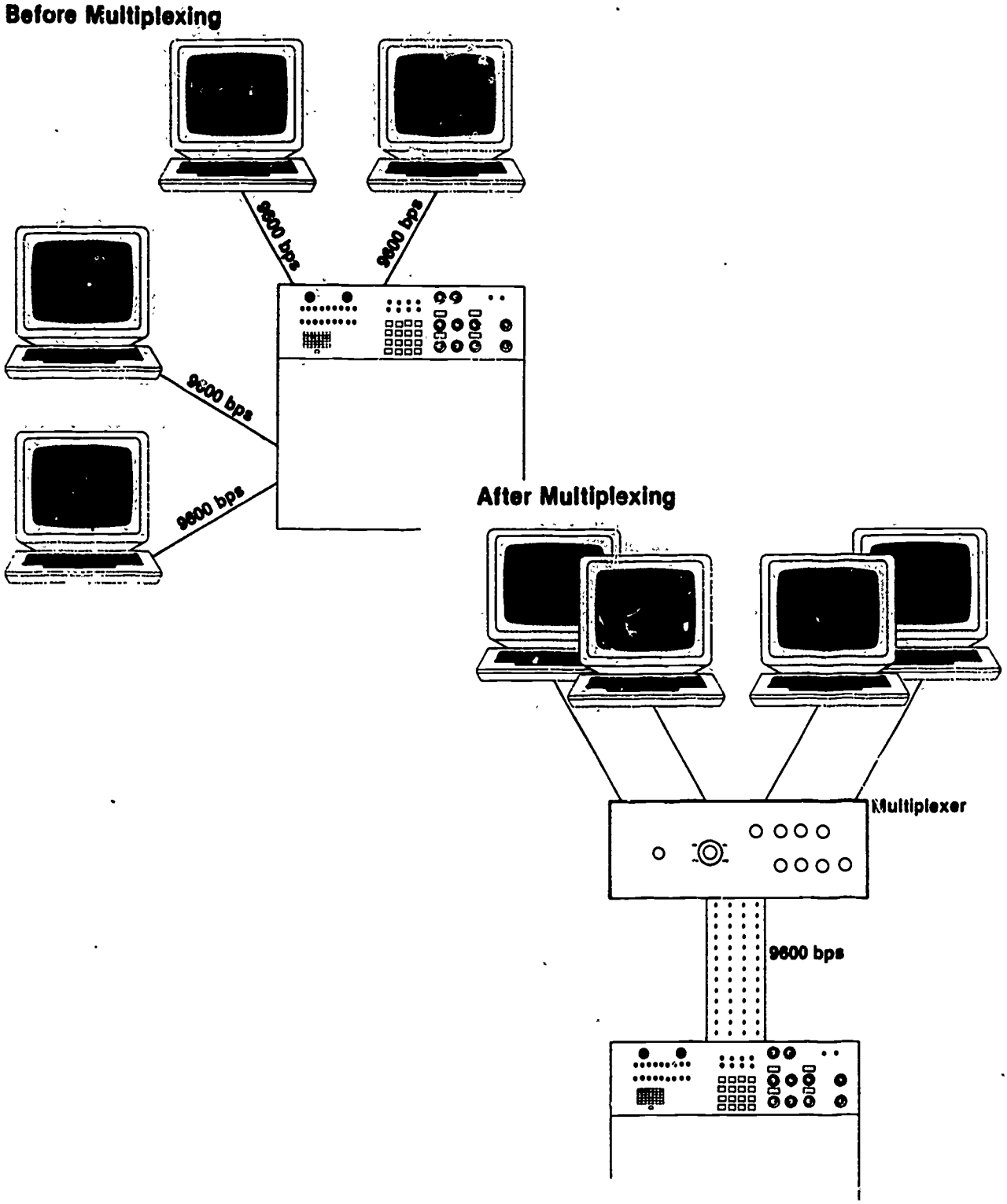


Figure 8-16



Tradeoffs in Cost-Performance:
Multiplexing-vs-Multiple Lines When Testing System Performance

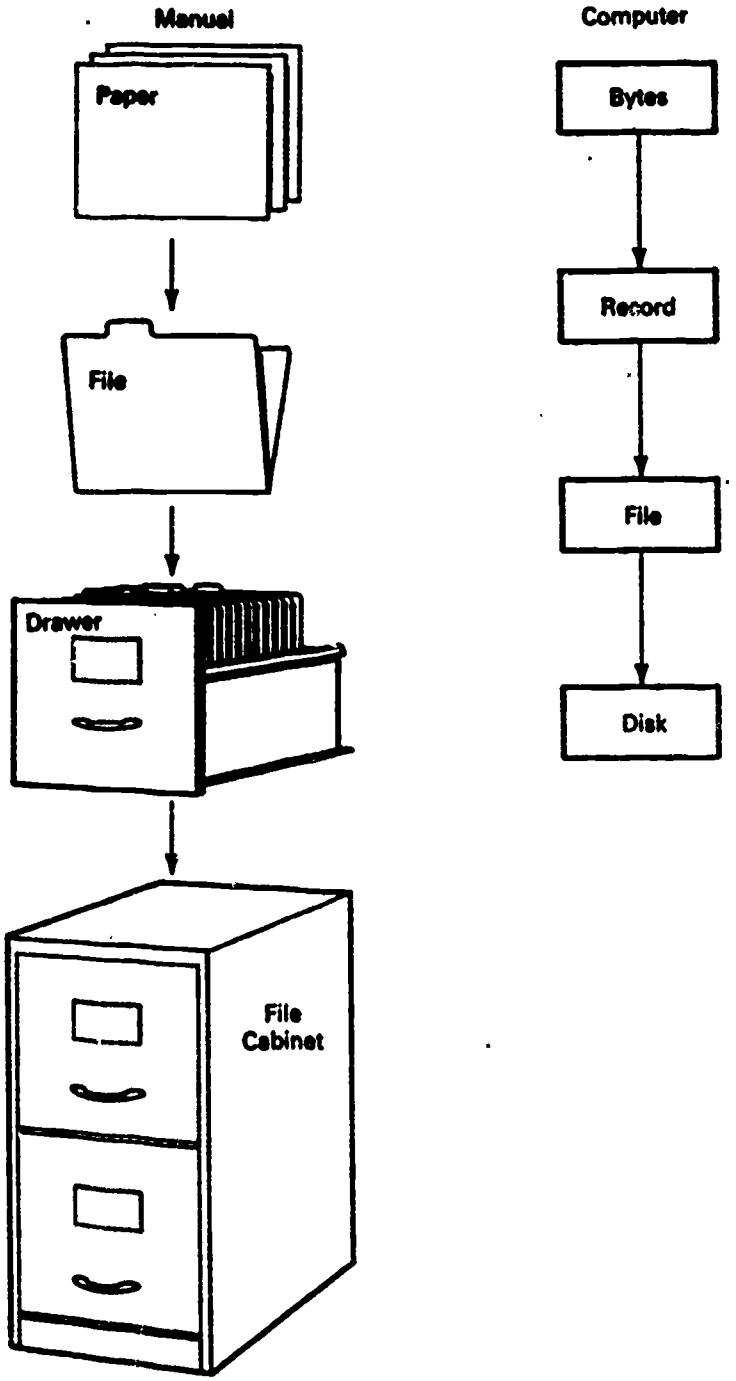


Computer Software Technology: An Introduction

- ☐ What is software ?

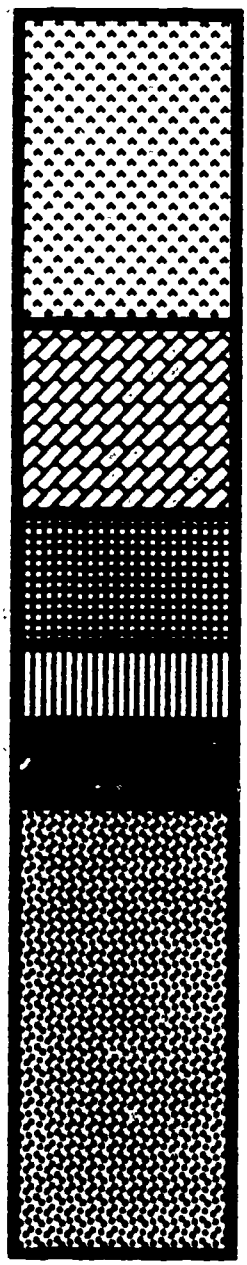
- ☐ Types of software
  - ◇ Operating systems
  - ◇ Programming languages
  - ◇ Utilities
  - ◇ Applications software

- ☐ Other 'types' of software
  - ◇ Data files
  - ◇ Documentation


Manual
Paper
File
Drawer
File
Cabinet
Computer
Bytes
Record
File
Disk

SOFTWARE COMPONENTS

A PROCESS OF COLLABORATION



Operating system software

Database management system

Teleprocessing monitor

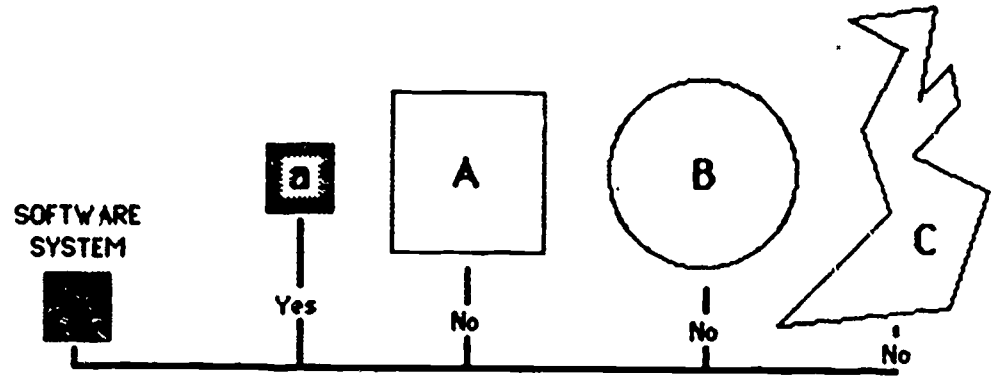
Utilities (spoolers, program librarian, etc)

Programming language compilers/iterpreters

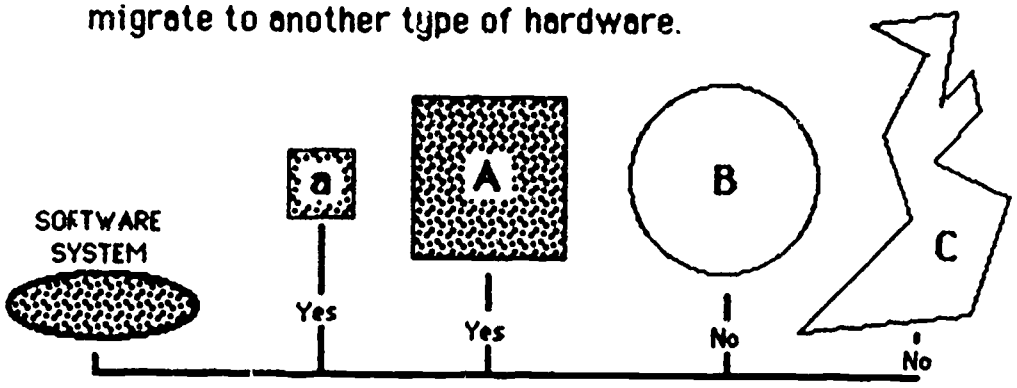
Vendor proprietary software programs and program work areas

VENDOR APPROACHES TO THE DESIGN OF PROPRIETARY HARDWARE/SOFTWARE PRODUCTS

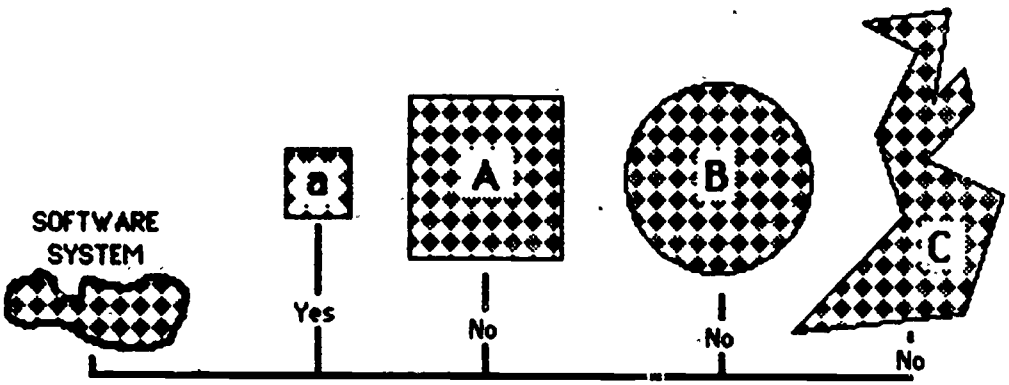
1. Machine dependent software; Software cannot migrate to other hardware products, even from same manufacturer.



2. Machine 'family' dependent software; Software can be used on other hardware from same manufacturer, but cannot migrate to another type of hardware.



3. Machine independent software; Designed to run on a wide variety of different types of computer hardware.

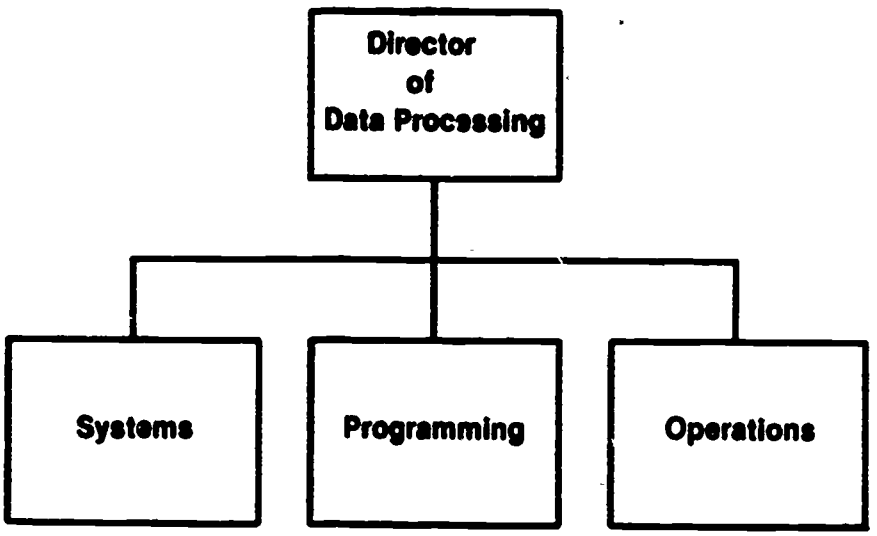


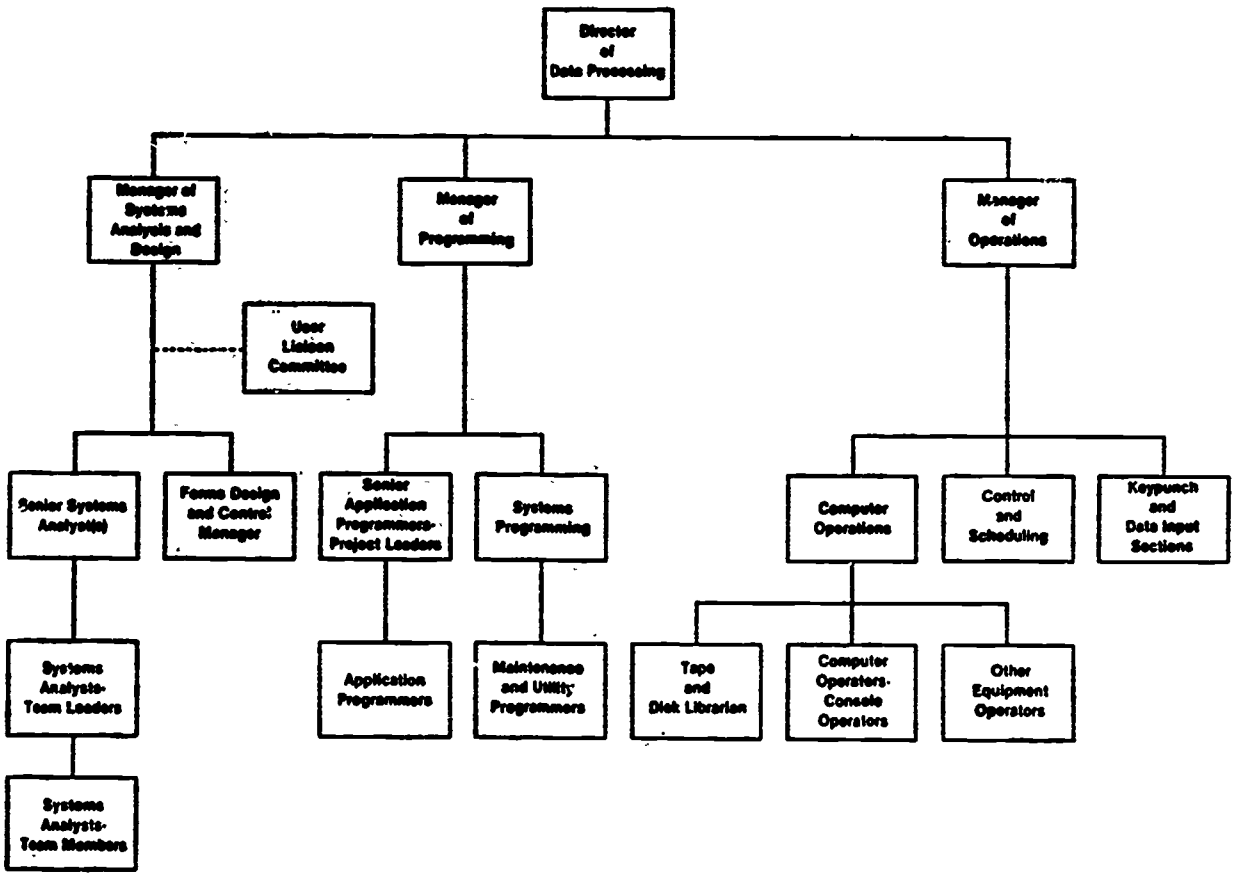
Data Processing Organization & Management: An Introduction

- Organization of data processing
  - Systems
  - Programming
  - Operations

- Special functions performed by data processing
  - Data management
  - Data entry and control
  - Documentation
  - Telecommunications management

- How to 'be successful' in dealings with data processing...


Director
of
Data Processing
Systems
Programming
Operations


Director of Data Processing
Manager of Systems Analysis and Design
Manager of Programming
Manager of Operations
User Liaison Committee
Senior Systems Analyst(s)
Forms Design and Control Manager
Senior Application Programmers-Project Leaders
Systems Programming
Computer Operations
Control and Scheduling
Keypunch and Data Input Sections
Systems Analysts-Team Leaders
Application Programmers
Maintenance and Utility Programmers
Tape and Disk Librarian
Computer Operators-Console Operators
Other Equipment Operators
Systems Analysts-Team Members

Library Automation Standards and Protocols: An Introduction

- ☐ What are standards
- ☐ Need for standards in the library environment
- ☐ Issues related to standards
  - ◇ Premature standards
  - ◇ Conflicting standards
  - ◇ Overly rigid standards
  - ◇ Defective standards
- ☐ Standards Organizations
  - ◇ American National Standards Institute [ANSI]
  - ◇ National Information Standards Organization [NISO] (Z39)
  - ◇ International Organization for Standardization [ISO]
- ☐ Z39.2-1979 Bibliographic Information Interchange [MARC]
- ☐ Z39.49-1985 Computerized Book Ordering
- ☐ ASC X3 Accredited Standards Committee on Information Processing Systems

Types of Library Automation

- ☐ Local library automation

- ☐ Regional library automation

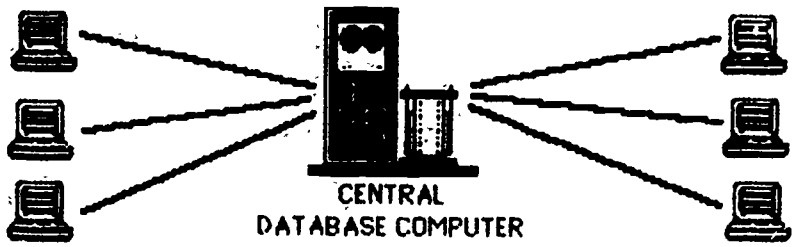
- ☐ Statewide library automation

- ☐ National library automation

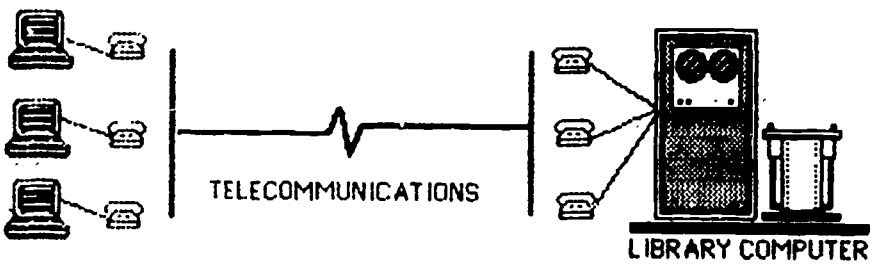
- ☐ International library automation

Technology options for resource sharing among libraries...

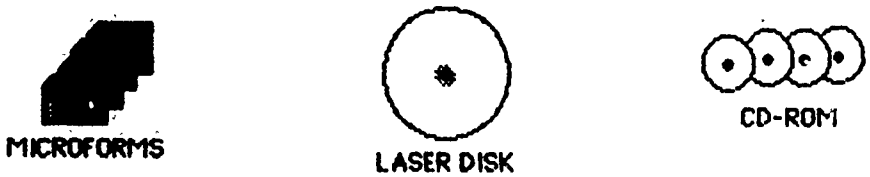
OPTION 'A': Centralized computer; all libraries connected.



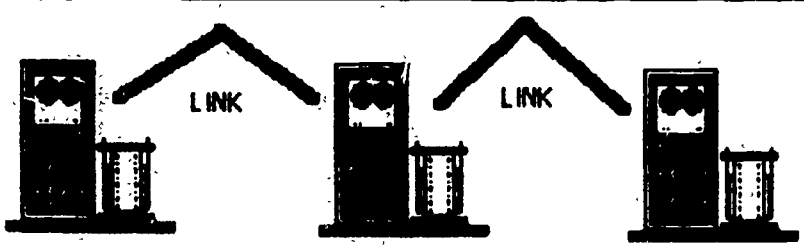
OPTION 'B': Centralized computer; libraries 'dial-in' using the telephone system.



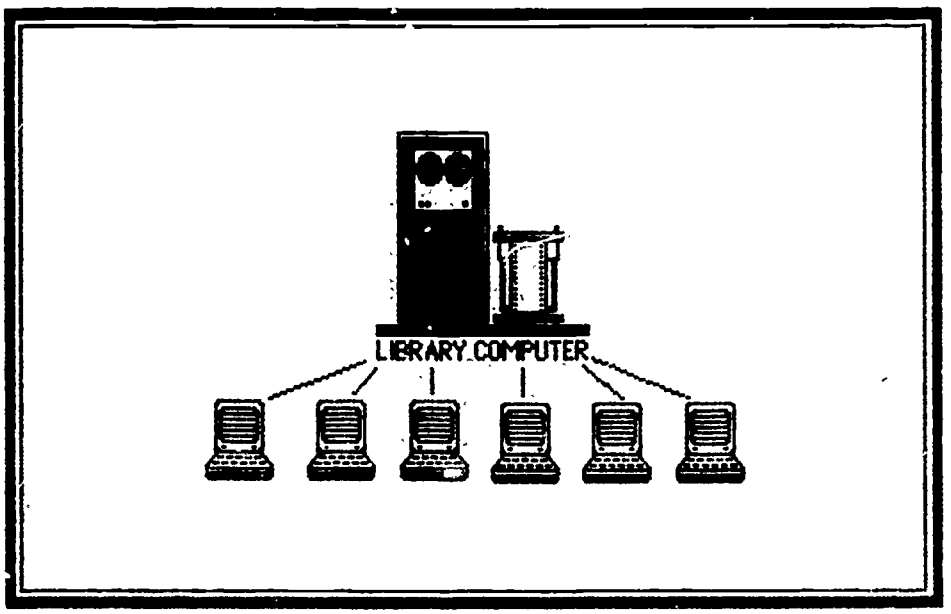
OPTION 'C': Offline union list; different technologies available; [microforms; laser disk; CD-ROM]



OPTION 'D': Linked local automated library system.



OPTION 1: Single library owns and operates computer.



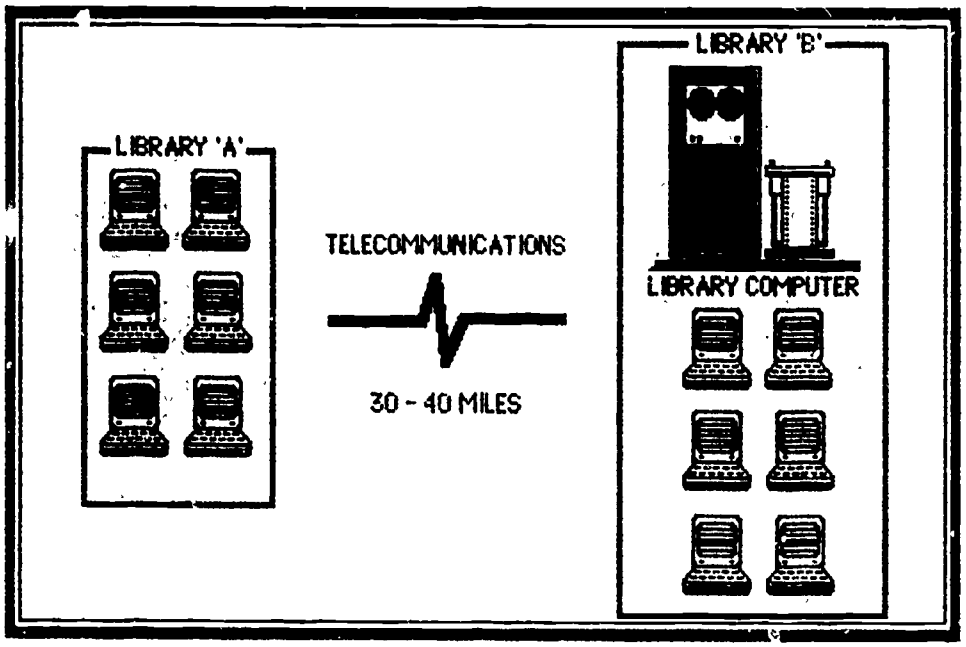
Technology Risk: Low ..... for library with 1 - 75 terminals.
Moderate.... for library with 76+ terminals.

Financial Risk: Low.

Management Skills Required: Low.

Size of Vendor Marketplace: Large [approximately 25-30].

OPTION 2: .Two libraries share automated library system.



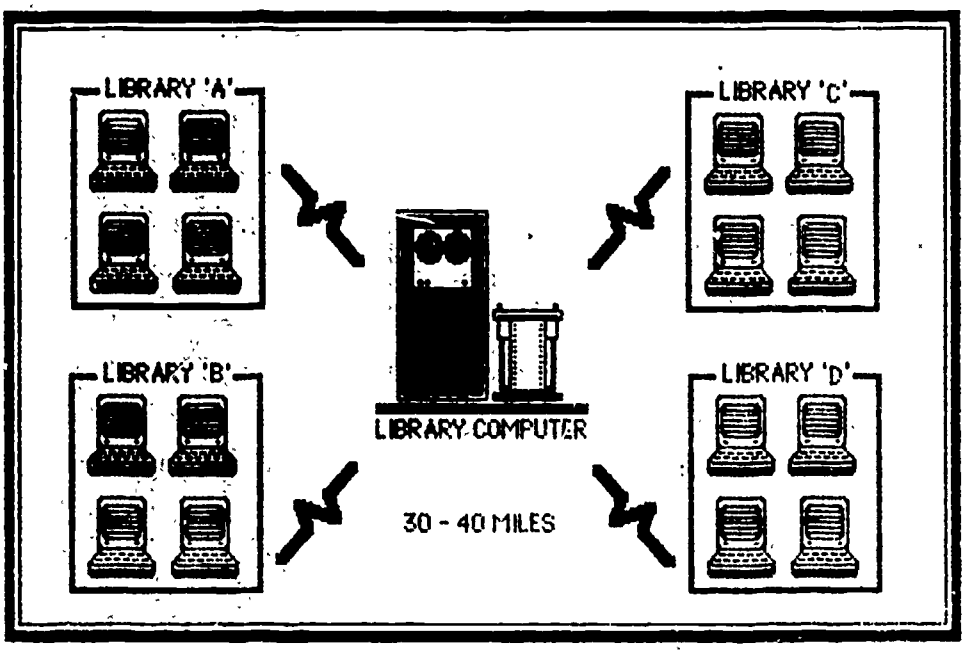
Technology Risk: Moderate... for libraries with 1 - 75 total terminals.
High... for libraries with 75+ total terminals.

Financial Risk: Low; if libraries within 10-15 miles apart.
Moderate; if libraries within 16-40 miles apart.
High; if libraries more than 40 miles apart.

Management Skills Required: High; requires telecommunications.

Size of Vendor Marketplace: Moderate [approximately 8-10].

OPTION 3: Sub-regional shared system; 4-6 libraries.



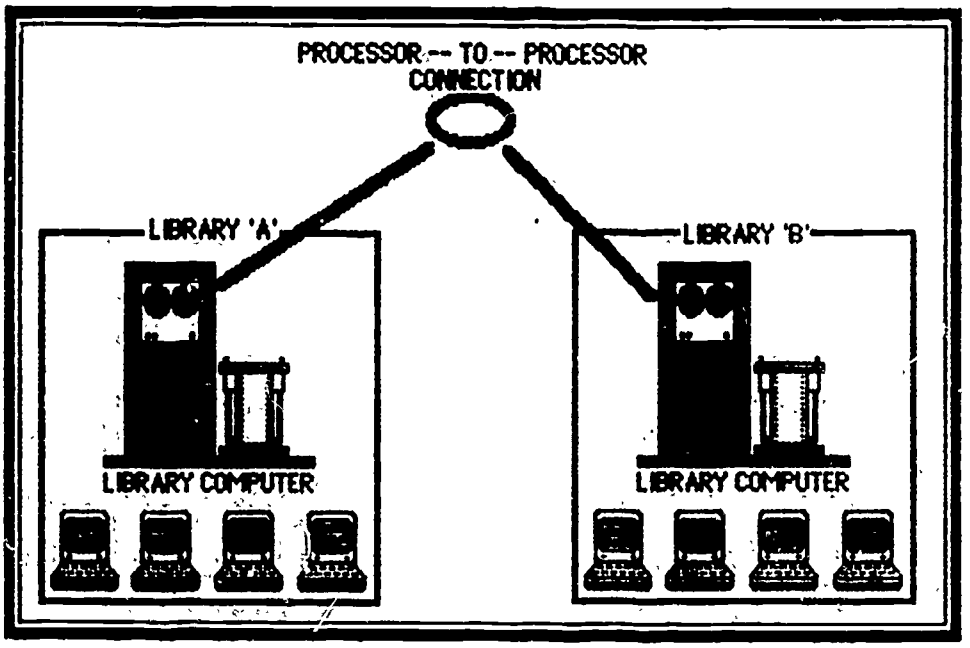
Technology Risk: Moderate... for system with 1-75 terminals.
High.... for system with 76+ terminals

Financial Risk: Moderate; if libraries within 10-30 miles apart.
High; if libraries within 30-50 miles apart.
Very High; if libraries more than 50 miles apart.

Management Skills Required: High; governance & contract issues.

Size of Vendor Marketplace: Moderate [approximately 3-5].

OPTION 4: Regional system -- linked automated library systems.

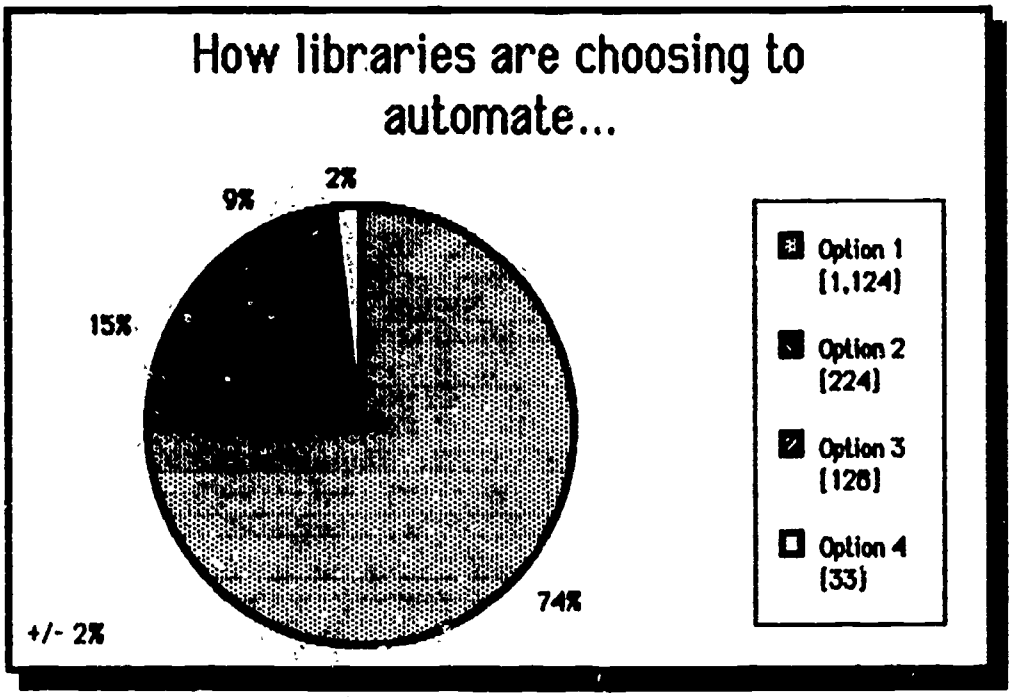


Technology Risk: Very high.

Financial Risk: Very High.

Management Skills Required: Very high; software development; governance; cost allocation.

Size of Vendor Marketplace: Very small [approximately 1-2].


How libraries are choosing to automate...
2%
9%
15%
74%
+/- 2%
Option 1 (1,124)
Option 2 (224)
Option 3 (128)
Option 4 (33)

Evolution of the Integrated Library System

- ☐ Circulation only systems
- ☐ Circulation systems; with interface to bibliographic utilities
- ☐ Circulation systems; with inquiry to circulation files
- ☐ Multi-functional systems (including OPAC)
- ☐ Integrated systems
- ☐ Linked systems (from different vendors)

Library Automation Project Planning

- ☐ Who should be involved in the planning of a project ?
  - ◇ Library staff
  - ◇ Library users
  - ◇ Institutional administrators
  - ◇ Data processing professionals
  - ◇ Others

- ☐ Choices of automated library systems
  - ◇ Turnkey
  - ◇ Software only - licensed
  - ◇ Software only - home grown

- ☐ Open procurement -vs- sole source procurement
  - ◇ Choosing a system by 'best bid' [proposals]
  - ◇ Choosing a system by 'low bid' [bids]

Open Procurement - An Overview

- ☐ Development of the procurement documents
  - ◇ Request for Information [RFI]
  - ◇ Request for Proposals [RFP]
    - Instructions
    - Alternate Proposals
    - Specifications
  - ◇ Invitation to Bid [ITB]
    - Specifications

- ☐ Evaluation of Vendor Responses
  - ◇ Subjective judgment technique
  - ◇ Cost-only technique [low bid]
  - ◇ Weighted scoring technique
  - ◇ Cost-effectiveness ratio technique
  - ◇ Least total cost technqiue
    - Multiple year cost analysis
    - Adjusted costs for missing components

I. Introduction
  A. Purpose
  B. General information and chararteristics of the library

II. Rules governing competition
  A. Address or deliver proposals to:
  B. Date of submission
  C. Schedule of activities
  D. Proposal validity period
  E. Economy of preparation
  F. Format of proposal
  G. Evaluation process
  H. Addendum and supplements to RFP
  I. Contact between vendor and library
    1. Oral presentations
    2. Vendor's conference
    3. Written questions
    4. Protests
  J. Extension of time
  K. Debriefing
  L. Late proposals
  M. Rejection of proposal
  N. Vendor's costs
  O. News releases
  P. Use of RFP ideas
  Q. Return of RFP
  R. New equipment
  S. Pricing considerations
  T. Payment schedule
  U. References
  V. Contractor responsibility
  W. Model or suggested contact
  X. Vendor qualifications
  Y. Site inspection

III. Requirements
  A. Definition of terms
  B. General requirements
  C. Mandatory requirements/ specifications
  D. Desired specifications
  E. Responses to specific questions
  F. Work plan or progress payments
  G. Acceptance criteria
  H. Vendor support
  I. Data conversion
  J. Training
  K. Response time requirements
  L. Documentation
  M. Supplies needed
  N. Bid deposits
  O. Performance bonds
  P. Annual appropriation of funds
  Q. Maintenance

IV. Proposal Instructions
  A. System proposal
    1. Hardware configuration
    2. Software
    3. Site preparation
    4. Training
    5. Vendor support
    6. Reference sites
    7. Delivery lead time
    8. Maintenance
  B. Cost data
    1. Hardware
    2. Software
    3. Shipping & insurance
    4. Installation
    5. Acceptance tests
    6. Transaction charges (if any)
    7. Maintenance
    8. Other services

Library Automation Budgeting

- Types of library automation costs
  - Staff
    - Planning/procurement
    - Installation/training
    - Ongoing operation
  - Automated library system [initial & onging]
    - Computer hardware
    - Computer software
    - Replacement & maintenance
  - Data
    - Retrospective conversion [bibliographic, item, patron]
    - Current conversion [bibliographic, item, patron]
    - Data auditing and control [authority control]
  - Preparation/Operation
    - Computer site
    - Procurement related
    - Consumables

Data Conversion: An Introduction

- Types of data conversion
  - Bibliographic
  - Patron
  - Item
  - Other

- Issues related to retrospective bibliographic data conversion
  - Standards
  - Weeding
  - In-house conversion
  - Commercial services [issues of cost, speed, and quality]
    - minimal in-house involvement
    - moderate in-house involvement
    - heavy in-house involvement
  - Regional and national union catalogs

- Issues related to retrospective item data conversion
  - Standards
  - Local holdings information
  - 'Smart item labels'
  - Bar -vs- OCR labels
- Issues related to retrospective patron conversion
  - Standards
  - Re-registration of patrons
  - Using student record information
  - Maintaining the patron database
  - Patron cards.....
- Other types of data conversion
  - Authority control [name/subject]
  - De-duping of archival tapes

Topics for Day 2

The Library Automation Marketplace

- ☐ Commercial Vendors
  - ◇ Microcomputer software vendors
  - ◇ Software vendors [mini-mainframe systems]
  - ◇ Turnkey vendors
- ☐ Service Bureaus
  - ◇ Retrospective conversion vendors
  - ◇ Technical services vendors
  - ◇ Remote circulation vendors
- ☐ Automation Consultants
  - ◇ Consulting firms [full time]
  - ◇ Individual consultants [full time]
  - ◇ Librarian/consultants [part time]

PLANNING FOR INDIVIDUAL AND COOPERATIVE LIBRARY AUTOMATION PROJECTS: AN OVERVIEW OF THE PROCESS

As the cost/benefit ratios of automated systems continue to improve and the entry level cost of a standalone, turnkey system continues to drop -- an increasing number of libraries will find an automation project is within their reach. In most cases, whether the project is a single institution or a multi-institutional cooperative, the investment in an automated library system will be a long term, multi-year financial commitment. This results in a complex planning environment which can be addressed only through extensive and careful planning. This overview is designed to provide managers with a basic introduction to the planning components and procedures which should be completed by library staff, perhaps with the assistance of an automation consultant.

There are seven (7) possible components to the automation planning process. How many of these procedures should be performed largely depends upon the specific automation objectives of the library institution(s).

Process #1: Automation Project Long Range Plan (60 Month Plan).

Process #2: Cost / Benefit Analysis.

Process #3: Cost Allocation And Governance Plan (Multi-Institutional Projects).

Process #4: Data Conversion Cost Analysis And Plan.

Process #5: Project Task Inventory And Implementation Schedule.

Process #6: Project Budget Analysis and Plan.

Process #7: Telecommunications Analysis And Plan.

1. Automation Project Long Range Plan (60 Month Plan).

The automation project Long Range Plan is an executive summary document (10-15 pages) which provides basic descriptive information about the proposed project to inform library supporters, funders, staff and patrons. This document is designed to serve as a non-technical abstract of the major automation goals of the project, the general tasks necessary to accomplish the stated goals, and a general timetable [milestones] for implementation of the project.

Typically, the Long Range Plan would be organized as follows:

1.1 Project history;
1.2 Project goals and service objectives;
1.3 Participating institutions [if a shared system];
1.4 Project organization and governance;
1.5 Description of the computer environment (single institution, network, etc.) to be established;
1.6 Project staff;
1.7 Project resources; and,
1.8 Timetable and milestones.

2. Cost / Benefit Analysis Report.

Few library automated systems operate within the 'ideal' environment. Every institution has certain political, geographic, and financial resource constraints within which any activity, including automated library systems, must operate. In order to properly document the various automation options (models) available to the library and the varying levels of services and benefits [within each model] which can be achieved - a cost/benefit comparison should be performed. It is important to note that the purpose of a cost/benefit analysis is not to focus only on the possible reduction of library costs to deliver services.

Cost/benefit is a study procedure to present managers with the different benefit and services 'packages' which are available and the related costs to deliver those benefits and services. This study is necessary in order to:

(a) Identify each model capable of deliverying desired services and benefits (within the broad fiscal capabilities of the library);

(b) Specifically define the degrees of service delivery within each model; and,

(c) Indicate the detailed costs to implement and maintain each system model - the costs associated with providing the defined services.

The study should, for each model identified, provide a detailed narrative description of the technical hardware/software environment which would result and a cost profile using a five (5) or seven (7) year Least Total Cost algorithm [depending on the intended or anticipated life of the system].

3. Cost Allocation And Governance Plan. (Multi-Institution Projects).

Before libraries can come together to share the costs and benefits of an automated library system, it will be necessary to carefully define:

(a) The proper way(s) to assign costs to the participants, and,
(b) How the project will be managed.

For these reasons, various governance and cost allocation options should be identified and defined for each variation of each system model identified. Until this information is documented and available, it is difficult for a library manager [and the institution] to evaluate each possible model's related benefits and costs given the needs and objectives of that particular library institution.

First, each formula should be defined and described (flat membership cost allocation, costs assigned per terminal, costs assigned by transactions, a combination, etc.). Secondly, given the predicted total cost of each model (based upon the Cost/Benefit Analysis Report), specific cost data for each participating library institution must be defined for each of the costing formulas under consideration.

Governance must be studied as a separate, though related, issue. While it may be possible to get participating institutions to agree on assignment of costs, failure to reach a concensus about decision making for the cooperative project will place it in jeopardy. Governance must be specifically defined since it will be necessary for the governing body of each participating library institution to contractually obligate that institution to the cooperative effort.

At a minimum, this study process should define:

3.1 Purpose and goals of the cooperative project;

3.2 Legal and tax status;
3.3 Membership categories;
3.4 Governance bylaws, by which decisions will be made (voting rights, etc);
3.5 Structure and organization (committees, user groups, task forces, etc.);
3.6 How costs will be allocated;
3.7 Distribution of title to all property (hardware, software, etc.);
3.8 Ownership of the database;
3.9 How institutions can be admitted to the cooperative;
3.10 How institutions can withdraw from the cooperative.

4. Data Conversion Cost Analysis And Plan

With few exceptions, automation projects will involve a long, difficult, and expensive data conversion process. Lack of proper attention and planning for this activity can result in expensive hidden project costs and, frequently result in projects falling far behind schedule. When the computer center has been properly prepared and the software is loaded and ready -- will the library have clean, machine readable database to load and operate on the system ?

As with the evaluation process required to select the optimal computer equipment/software model for the library, it is probable that the library explore various approaches to [and related costs] to prepare and convert data. There are three primary types of data which must, at some point during the implementation of the automated system, be converted to machine readable form for manipulation by the automated system. These are:

(a) Bibliographic data (one record per library material title);

(b) Patron data (one record per registered patron and/or staff); and,

(c) Item data (one record per physical library material piece).

The costs and time necessary to perform data conversion vary widely depending on the whether the library completes the conversion independently, in conjunction with a regional network or national utility, or in collaboration with the system vendor. The library should conduct a study to identify and describe each of the data conversion options available to it. In most cases, libraries will accomplish the conversion of their data (all three types) by a combination of methods - including some orginial key entry by library staff. Once the raw databases have been constructed, the library may also desire to perform special preload

processing, such as authority control or the creation of 'smart' item labels.

In evaluating the various data conversion options, managers should look for an alternative that balances and optimizes the following factors:

5.1 Service bureau costs to the library:
- ☐ Data base royalities;
- ☐ Special equipment and/or software;
- ☐ Setup fees and processing charges;
- ☐ Costs for vendor labor (usually costed by keystroke);
- ☐ Supplies & shipping/handling;
- ☐ Special services (authority control, duplicate record elimination, etc.).

5.2 Inhouse costs to the library:
- ☐ Labor and benefits;
- ☐ Supplies;
- ☐ Equipment/software.

5.3 Timetable necessary to convert the data to machine readable form.

5.4 Quality of the records resulting from the conversion:
- ☐ Accuracy of information;
- ☐ Completeness;
- ☐ Commonality - adherence to prescribed standards.

5.5 Database maintenance (during the building of the databases and once the system is in full operation.)

5. Project Task Inventory And Implementation Schedule.

At some point during any automation project, it becomes necessary to become specific about how the project will be implemented. While there are many different techniques managers can use to plan, control and monitor the implementation of an automated system, the process should focus on three (3) primary elements:

6.1. Task Inventory.
Each of the specific tasks necessary to procure, install, test, and bring the system into complete and full operation should be identified (write specifications for site preparation, schedule installation of data lines from telephone company, advertise for automation librarian, etc.).

6.2. Task Staffing Assignments.
For each task, specific staff should be identified who will perform and be responsible for each of the tasks on the inventory.

6.3. Schedule.
Each task should be placed on a schedule showing the beginning and completion deadlines for the task. It is recommended that libraries select a schedule monitoring process, such as critical path scheduling and analysis, which can document:

6.3.1 Task Deadlines.
Establish a specific date the task is to be completed.

6.3.2 Task Relationships.
Document tasks which are dependent on or related to other tasks. For example, the loading of bibliographic tapes into a standalone system comes after all or some

of the following (a) acquisition and testing of tape drive equipment, (b) load of software by vendor to build database, (c) conclusion of building database by retroconversion vendor.

6.3.3 Task Alternative Paths.
Should a critical path be violated, will the library know (a) alternative ways to accomplish the task to regain position on the original schedule, or, (b) how to calculate and adjust the remaining tasks and to shift backwards (or in some cases forward) the remaining tasks scheduled.

6. Project Budget Analysis and Plan.

Once a particular automation model [hardware/software configuration] has been selected and the appropriate task/implementation schedule determined, it will be necessary for library managers to prepare an exact project budget. This budget is designed to show the specific funds to be allocated, the source of the funds, and estimates as to when those costs will be paid. When designing the project budget, it is necessary to consider the following:

7.1. Cost Type And Amount.
Line items should be established for each specific project cost (15 backup disk packs, 12 anti-static mats, 240 hours of contract data entry for patron record processing, etc.). A unit and total cost should be specified for each of these line items.

7.2. Division Of The Cost Over Time.
Certain costs will be divided between different fiscal budget periods. The budget plan should be oriented to the fiscal cycle of the institution and document this division of costs over multiple years (hardware payments divided over 60 months, etc.).

7.3. Source Of Project Income.
In most cases, libraries must secure additional funding - over and above the normal ongoing library budget(s) - to pay for the procurement and installation of the system. While many capital expenditures are taken from the supplemental funding, for some project costs, all or part, are 'absorbed' from funds out of the regular library budget (staff, supplies, utilities, etc.). The budget should clearly document the source of funds for each expenditure.

7. Telecommunications Cost Analysis And Plan

Many library automation projects will provide services to users in locations which are too far (geographically) from the computer site to be connected directly [by a cable] the the computer system. This requires the use of data communications hardware/software to provide services these remote locations. On smaller projects, requiring only one or two different sites and 10 or less terminals, the costs and options for data communications can be included as one of the design and cost elements of the Cost / Benefit Analysis process. In larger systems, however, a separate study should be completed to focus on the different cost - vs - benefit options of various data communications models. This type of study will usually need to be completed by a specialist in computer technology and/or data communications.

Issues which would be included in this type of study would include:

8.1. Data Communications Models.
The consultant would explore the various types of data communications technology models available to the library, including:

(a) Traditional telecommunications (voice grade telephone lines, digital data transmission lines, etc.)
(b) Special telecommunications designs (multiplexed devices, multi-drop lines, packet-switching, etc.)
(c) Emerging options (cable loops, microwave communications, fiber optics, etc.)

8.2. Cost - vs - Performance.
The investigator must identify and project each of the costs necessary to deliver the computer services to each library

location. It is also important to measure each alternative in terms of the cost relationship between the (a) reliability of the data communications model and the (b) cost to provide that level of reliability.

8.3. Growth Potential And Technical Obsolescence.
Certain models offer restricted or open library network growth potential. Certain models, for example, may be inexpensive for the initial stages of the project, but require higher growth costs or limit growth entirely. The long term options and constraints of each model should be projected and documented.

8.4 Ownership Of Telecommunications Hardware/Software.
As with other computer equipment, software and data - the title concerning the hardware, software and databases of the cooperative project should be clearly stated.

8.5. Cost Allocation Of Telecommunication Costs.
In most library cooperatives, the member libraries are different distances from the primary computer facility, resulting in different telecommunication costs per institution to communicate. Managers should investigate different formulas and approaches to the allocation of telecommunication costs to participating institutions. Care must be taken to clearly define (a) the method used to allocate costs and (b) estimates of these costs for each participating institution.

Vendor Proposal Evaluation Worksheet - _____

Item	Evaluation Item	Rating	Coeff. Value	SCORE	Comment	Ref.
1.	Vendor adherence with RFP instructions in preparing proposal responses:					
1.1	• General organization & completeness					
1.2	• Transmittal statement					
	◇ Proposal life					
1.3	• Business profile information					
1.4	• Pricing information					
1.5	• Hardware proposal forms					
1.6	• Software proposal forms					
1.7	• Other proposal documentation					
2.	Confidence in vendor organization fiscal stability, experience, & compentence:					
2.1	• General confidence rating					
2.2	• Liquidity ratio					
2.3	• Dun/Bradstreet rating					
2.4	• Stability & growth in sales/market					
2.5	• Vendor staffing:					
	◇ Analysis & programming staff					
	◇ Support staff					
2.6	• Systems installed					

Vendor Proposal Evaluation Worksheet - _____

Item	Evaluation Item	Rating	Coeff. Value	SCORE	Comment	Ref.
3.	Vendor experience in a comparable automated environment:					
3.1	• Comparable central site hardware					
3.2	• Comparable # terminals					
	◇ Circulation & others					
	◇ OPAC					
3.3	• Comparable database size					
3.4	• Comparable circulation transactions					
	• Reactions of site visitation team					
4.	Integrity of proposed architectures for the defined logical configurations:					
4.1	• Central site processing capacity					
4.2	• Central site storage capacity					
	◇ ratio of records to disk					
4.3	• Tele/data communications capability					
4.4	• Assessment of operating system					
4.5	• Assessment of programming language					
4.6	• Hardware maintenance facilities					
	• Growth paths and cost/performance					

Vendor Proposal Evaluation Worksheet - _____

Item	Evaluation Item	Rating	Coeff. Value	SCORE	Comment	Ref.
5.	Functional capabilities:					
5.1	• Circulation control subsystem					
5.2	• OPAC subsystem					
5.3	• Bibliographic maintenance subsystem					
5.4	• Acquisitions subsystem					
5.5	• Serials control subsystem					
5.6	• Reference subsystem					
5.7	• ILL subsystem					
5.8	• Film/media scheduling					
5.9	• Software interfaces					
5.10	• Other software requirements					
5.11	• Software maintenance resources					
5.12	• Software documentation					
6.	Costs:					
6.1	• Completeness of costing information					
6.2	• Relative ranking of hard/costs (year 1)					
6.3	• Relative ranking of 60 month costs					
6.4	• Relative ranking of other costs					
6.5	• Probable appropriateness of site prep					
6.6	• Probable appropriateness of staffing					
6.7	• Payment schedule appropriateness					

Vendor Proposal Evaluation Worksheet - _____

Item	Evaluation Item	Rating	Coeff. Value	SCORE	Comment	Ref.
7.	Implementation issues:		0.02			
7.1	• Training plan					
7.2	• Implementation timetable					
7.3	• Data conversion plan/timetable					
7.4	• Site preparation requirements					
8.	Contractual issues:		0.15			
8.1	• General comfort with proposed contract					
8.2	• General comfort with proposed maintenance contract					
8.3	• Warranties					
8.4	• Access to software code					
8.5	• Performance tests					
	◇ Test 1 [hardware quality]					
	◇ Test 2 [data load performance]					
	◇ Test 3 [functional test]					
	◇ Test 4 [storage capacity]					
	◇ Test 5 [full load response time]					
	◇ Test 6 [availability]					
	◇ Test 7 [training]					

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Vendor Proposal Evaluation Worksheet - _____

1.	RFP instructions		0.00			
2.	Vendor organization		0.00			
3.	Vendor experience / comparable site		0.00			
4.	Hardware/software architecture		0.00			
5.	Functional capabilities		0.00			
6.	Costs		0.00			
7.	Implementation factors		0.00			
8.	Contract issues		0.00			
	TOTAL(S):		0.00			

DOCUMENTING THE COSTS OF AUTOMATED OPAC SYSTEMS:

A CHECKLIST

1. Personnel costs (for all activities related to the procurement, installation, and continued operation of the system).
   - ☐ Direct salaries
   - ☐ Employee benefits
   - ☐ Institutional indirect costs related to salary/benefits

2. Computer equipment.
   - ☐ Central processing unit & all cabinets and cabling
   - ☐ Memory components
   - ☐ Operator console unit
   - ☐ Magnetic tape drive system
   - ☐ Disk storage system (including controllers and disk packs)
   - ☐ Printers
   - ☐ Terminals, wands, and local printers
   - ☐ Microcomputer backup systems

3. Communications equipment.
   - ☐ Modems
   - ☐ Multiplexors/concentrators
   - ☐ Port expansions
   - ☐ Line drivers

4. Other Equipment
   - ☐ Forms burster
   - ☐ Decollator
   - ☐ Backup power system

5. Software.
   - ☐ Library software
   - ☐ System software (operating system, microcode, languages, etc.)
   - ☐ Documentation

6. Maintenance.
   - ☐ Hardware
   - ☐ Software .

7. Telecommunications.
   - ☐ Line charges
   - ☐ Line installation costs
   - ☐ Telecommunications consultant

8. Training.
   - ☐ Training fees
   - ☐ Training materials
   - ☐ Travel

9. Data conversion costs.
   - ☐ Service bureau fees
     - √ Transaction costs
     - √ Computer access charges [monthly access fees]
     - √ Password charges
     - √ Connect time charges
     - √ Data storage fees
     - √ Royalty charges
     - √ Special processing fees (COM tape processing, etc.)
   - ☐ Machine readable labels for books and patron cards
   - ☐ Special bibliographic file processing (authority processing, duplicate record elimination, smart item labels etc.)
   - ☐ Legal costs to establish data conversion contract

10. Automated system staffing support.
- ☐ Office space
- ☐ Furniture
- ☐ Telephone costs
- ☐ Supplies
- ☐ Utilities
- ☐ Duplication and mailing costs
- ☐ Travel

11. Procurement process related costs.
- ☐ Automation consultant contract fees
- ☐ Legal fees
- ☐ Lease and/or interest charges
- ☐ RFP/Contract document preparation costs
  - √ Staff salaries & benefits
  - √ Document preparation, duplication, and distribution costs
- ☐ Onsite visitation travel expenses

12. System Preparation, Installation, & Implementation Related Costs.
- ☐ Architectural fees for site preparation
- ☐ Staff preparation of site specifications, etc.
- ☐ Site preparation costs
  - √ Suspended flooring
  - √ Air conditioning
  - √ Humidity and air filtering control
  - √ Electrical and plumbing alterations
  - √ Alarm systems
  - √ Security system
  - √ Computer room furniture and storage racks
  - √ Cabling
- ☐ Shipping charges & insurance
- ☐ Installation charges
- ☐ Performance bond costs

- ☐ Taxes
- ☐ Offsite storage costs

13. Supplies And Consumables
    - ☐ Stock forms (overdue notices, etc.)
    - ☐ Patron cards
    - ☐ Computer paper (line printer and local printers)
    - ☐ Magnetic tapes

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO-- Absorb	---------- Annual Cost
1. Central Processing Unit									
☐ CPU(s)									
☐ CPU cabinet									
☐ CPU cabling									
2. Added Memory									
3. Operator Console									
4. Magnetic Tape									
/Streamer Tape									
☐ Tape drive(s)									
☐ Tape drive cabinet									
☐ Tape drive cabling									
5. Disk Storage									
☐ Disk drive									
☐ Disk controller									
☐ Disk cabinet/bay									
☐ Disk cabling									
☐ Disk packs									
6. Line Printer									
☐ Line printer									
☐ Line printer cabinet									
☐ Line printer cabling									
☐ Print chains (ALA)									
Estimated Total:									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO-- Absorb	---------- Annual Cost
1. Terminals [Non-OPAC]									
☐ Year 1									
☐ Year 2									
☐ Year 3									
☐ Year 4									
☐ Year 5									
2. Terminals with Optical									
☐ Year 1									
☐ Year 2									
☐ Year 3									
☐ Year 4									
☐ Year 5									
3. Special OPAC Terminals									
☐ Year 1									
☐ Year 2									
☐ Year 3									
☐ Year 4									
☐ Year 5									
4. Special TS Terminals									
☐ Year 1									
☐ Year 2									
☐ Year 3									
☐ Year 4									
☐ Year 5									
5. Laser devices									
6. Local printers									
☐ Year 1									
☐ Year 2									
☐ Year 3									
☐ Year 4									
☐ Year 5									
Estimated Total:									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO-- Absorb	---------- Annual Cost
1. Front-end processor									
2. Modems									
☐ 300									
☐ 1200									
☐ 2400									
☐ Auto-answer									
3. Multiplexor									
☐ 2-channel									
☐ 4-channel									
☐ 8-channel									
☐ 16-channel									
☐ 32-channel									
☐									
☐									
4. Line Drivers									
☐									
☐									
5. Port Expansions									
☐									
☐									
6. Cabinets/bays									
7. Data Comm Cabling									
Estimated Total:									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO- Absorb	---------- Annual Cost
1. Library Software									
☐ Circulation									
☐ Reserve Room									
☐ OPAC									
☐ Serials									
☐ Acquisitions									
☐ Film/Media Booking									
☐ Management Stats									
☐ Cataloging Interface									
2. System Software									
☐ Operating System									
☐ Program Compilers									
☐ DBMS									
☐ Teleprocessing									
☐ Report Writer									
☐ Other									
3. Backup system (micro) software									
4. Gateway software									
5. Custom patron load interface									
Estimated Total:									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO- Absorb	---------- Annual Cost
1. Central Computer Staff									
Office Furniture									
☐ Desk									
☐ Side table									
☐ Chair									
☐ Bookcase(s)									
☐ File cabinet									
☐ CRT table									
☐ Local printer table									
2. Office Equipment									
☐ Telephone									
☐ Typewriter									
☐ Dictaphone									
☐ Photocopy machine									
☐ Telefacsimile									
3. Support Equipment									
☐ Forms burster									
☐ Rolling media truck									
☐ Mag tape table rack									
☐ Disk pack table rack									
☐ Rolling printout rack									
☐ Rolling paper cart									
☐ Print 'catch' basket									
☐ Paper dust vaccum									
4. Storage Equipment									
☐ Magentic tape racks									
☐ Disk pack shelves									
☐ Tape/disk cabinets									
☐ Printout racks									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO-- Absorb	---------- Annual Cost
1. Site Preparation									
☐ Architectural Fees									
☐ Suspended flooring									
☐ Air conditioning									
☐ Humidity control									
☐ Dust filtering									
☐ Fire alarm systems									
☐ Security system									
☐ Water alarm system									
☐ Cabling - internal									
2. Shipping/Insurance									
3. Installation charges									
4. Performance Bond Fee									
5. Taxes									
6. Offsite DB Storage									
7. System Insurance									
8. Software Escrow Fees									
9. Security Services									
10. Utilities									
☐ Electric									
☐ Gas									
☐ Water									
Estimated Total:									

Automation Project Budget Worksheet

YEAR = _____	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO-- Absorb	---------- Annual Cost
1. Library Forms/Notices									
☐ Overdue/fine									
☐ Hold/reserve									
☐ Renewal/recall									
2. Patron Cards									
3. Paper Supplies									
☐ Line printer									
☐ Local printer									
☐ Carbon set paper									
☐ Card stock paper									
4. Ribbons									
☐ Line printer ribbons									
☐ Local printer ribbons									
5. Magnetic tapes									
6. Disk Packs									
7. Computer Equipment									
Cleaning Supplies									
8. Bar Code (or OCR) Labels									
☐ Item labels									
☐ Patron labels									
Estimated Total:									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO-- Absorb	---------- Annual Cost
1. Consultant Fees									
☐ Automation									
☐ Telecommunications									
☐ Building									
☐ Retro Conversion									
2. Legal Fees									
3. Lease/Interest Charges									
4. RFP Document Related									
☐ Duplication of copies									
☐ Packaging/supplies									
☐ Postage									
5. Onsite Visitation									
☐ Aire Fare									
☐ Hotel									
☐ Meals									
☐ Local Transportation									
☐ Other									
6. Telephone References									
Estimated Total:									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO- Absorb	---------- Annual Cost
1. Retro Conv Services									
☐ Transaction costs									
☐ Computer access fees									
☐ Password fees									
☐ Connect time charges									
☐ Data storage fees									
☐ Record royalties									
☐ Special processing									
☐ Training/Install									
2. Supplies									
☐ Single labels									
☐ Double labels									
☐ Patron cards									
☐ Data entry forms									
3. Equipment									
☐ Lease charges									
☐ Installation charges									
☐ Shipping/insurance									
4. Special processing									
☐ Authority control									
- Name									
- Subject									
☐ Dup elimination									
☐ Smart label process									
☐ Edit lists									
☐ Smart label print									
☐									
5. Pre-load indexing of databases									
Total Estimated:									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO- Absorb	---------- Annual Cost
1. Analog line lease fees.									
□									
□									
□									
□									
□									
2. Digital line lease fees									
□									
□									
□									
□									
□									
3. Measured Use Charges									
4. Analog Installation									
5. Digital Installation									
6. Switching charges									
Estimated Total:									

Automation Project Budget Worksheet

	Quantity	Unit Price	Estimated TOTAL Price	++++++++++ New Funds	++YEAR ONE++ Absorb	++++++++++ Annual Cost	---------- New Funds	--YEAR TWO-- Absorb	---------- Annual Cost
1. Retro Conversion									
☐ Professional									
☐ Para-professional									
☐ Clerical									
☐ Student									
2. Item labeling									
☐ Professional									
☐ Para-professional									
☐ Clerical									
☐ Student									
3. Patron Conversion									
☐ Professional									
☐ Para-professional									
☐ Clerical									
☐ Student									
4. System Procurement									
☐ Professional									
☐ Para-professional									
5. Training									
☐ Professional									
☐ Para-professional									
☐ Clerical									
☐ Student									
6. System Operations									
☐ Professional									
☐ Para-professional									
☐ Clerical									
☐ Student									
Estimated Total:									

EXAMPLE CONTRACT LANGUAGE RELATED TO THE

(a) Contract for the Sale of Computer Equipment and the Lease of Computer Software

(b) Contract for the Maintenance of Computer Hardware and Software

Listed below are example contractual statements which the Library desires be included in the contract established with the Vendor. Vendors should reference these items when completing the contract language proposal response forms. The following notations will indicate to which of the contracts the library desires inclusion of the proposed language: [B] Both the purchase and maintenance agreement; [P] Purchase Agreement only; [M] Maintenance agreement only. It is anticipated that this list of contractual provisions will be expanded during contract negotiations.

(a) Identification of Parties to the Agreement Clause. [B]

Both the Vendor and Library organizations shall be clearly identified. Neither of the identified parties to the Agreement shall assign or encumber any of its rights, or delegate or subcontract any of its duties defined in the Agreement, in whole or in part, to other third parties unless the other party to the Agreement gives prior written consent. Subject to the foregoing covenant against assignment and delegation, the rights created by the Agreement shall pass to the benefit of the properly identified party and the duties and obligations resulting from the Agreement shall bind the properly identified party and their respective successors and assignees.

(b) Entire Agreement Clause. [B]

This Agreement, including appendices and referenced attachments, constitutes the entire Agreement between Library and Vendor and supercedes all proposals, presentations, representations, and communications, whether oral or in writing, between the parties on this subject.

(c) Agreement Extension and Modification Clause. [B]

The Agreement may be modified or extended in accordance with the following procedures. In the event that all parties to the Agreement agree that such changes would be of a minor and nonmaterial nature, such changes may be effected by a written statement which describes the situation and is signed, prior to the effectiveness, by all parties. In the event that the changes are determined by either or all parties to the Agreement to be of a major or complex nature, then the change shall be by formal amendment of the Agreement signed by the parties and made a permanent part of the Agreement.

(d) Term of the Agreement Clause. [M]

The term of the Agreement shall be clearly identified in the contract, but shall not be for less than five (5) years from the effective date. Thereafter, the Agreement shall automatically be extended for one (1) year unless the Library notifies the Vendor, in writing, that the automatic extension is not desired. At that time, the contract shall expire.

(e) Applicable and Governing Law Clause. [B]

The Agreement shall be subject to all laws of the Federal Government of the United States of America and to the laws of the State of Texas. All duties of either party shall be legally performable in Texas. The applicable law for any legal disputes arising out of this contract shall be the law of (and all actions hereunder shall be brought in) the State of Texas, and the form and venue for such disputes shall be _____.

(f) Notices Clause. [B]

All notices or communications required or permitted as a part of the Agreement shall be in writing (unless another verifiable medium is expressly authorized) and shall be deemed delivered when:

(a) actually received, or

(b) upon receipt by sender of a certified mail, return receipt signed by an employee or agent of the party, or

(c) if not actually received, 10 days after deposit with the United States Postal Service authorized mail center with proper postage (certified mail, return receipt requested) affixed and addressed to the respective other party at the address set out in the section of the Agreement titles "Identification of the Parties to the Agreement" or such other address as the party may have designated by notice or Agreement amendment to the other party, or

(d) upon delivery by the Library of the notice to an authorized Vendor representative while at the Library site.

Consequences to be born due to failure to receive a notice due to improper notification by the intended receiving party of a new address will be borne by the intended receiving party.

(g) Survival Clause. [B]

All duties and responsibilities of any party, which either expressly or by their nature extend into the future, shall extend beyond and survive the end of the contract term or cancellation of this Agreement.

(h) Force Majeure Clause. [B]

Timely performance is essential to the successful initial implementation and ongoing operation of the automated Library system. However, neither party will be liable for delays in performing its obligations under this Agreement to the extent that the delay is caused by force majeure. Force majeure acts shall include but not be limited to acts of God, strikes, lockouts, riots, acts of war, epidemics, government regulations imposed after the fact, fire, communications line failures, earthquakes, or other disasters. Force majeure shall not be allowed unless:

(1) Within three (3) calendar days of the occurrence of force majeure, the party whose performance is delayed thereby shall provide the other party or parties with written notice explaining the cause and extent thereof, as well as a request for a time extension equal to the estimated duration of the force majeure events, and;

(2) Within seven (7) calendar days after the cessation of the force majeure event, the party whose performance was delayed shall provide the other party written notice of the time at which force majeure ceased and a complete explanation of all pertinent events pertaining to the entire force majeure situation. Unless provided prior written notice of permission by the other party or parties to the Agreement, under no circumstances shall the permissible delays justified by force majeure extend beyond one hundred-twenty (120) days from scheduled dates or from unscheduled deadlines resulting from and established due to failure of the system to meet performance examination(s) as documented in the Agreement. Failure to secure prior written permission extending the due date after the one hundred-twenty (120) days, even under force majeure conditions, shall

constitute default by the party failing to meet the required deadline. Under no circumstances shall delays caused by a force majeure extend beyond one hundred-twenty (120) days from the scheduled delivery or completion date of a task, unless by prior (to the one hundred-twenty (120) days) written notice of permission of the other party. Failure to secure this written prior permission, even in the case of force majeure, shall constitute default by the party failing to meet the requirement. Either party shall have the right to cancel the contract Agreement if Force Majeure suspends performance of scheduled tasks by one or more parties for a period of one hundred-twenty (120) or more days from the scheduled date of the task. If a cancellation due to a Force Majeure occurs before title passes to the Library, the Vendor may keep any parts of the system as it can salvage, but must remove same at its own expense. If cancellation occurs due to a Force Majeure after title passes to the Library, the system shall remain with the Library and the Vendor shall be entitled to any such payments as have accrued according to the payment schedule.

(i) Incorporation By Reference. [B]

The Vendor shall supply equipment, software, and other related services adequate to accomplish the requirements as set forth in the Request For Proposals and the Vendor response to the Request for Proposals. Parties agree that where there is a conflict between terms of this Agreement and the information presented in the references documents, this Agreement shall take precedence. The parties also agree that where there is not a conflict between this Agreement and the information presented in the referenced documents, that

all terms, conditions and offers presented in the vendor's proposal shall herein be referenced to the Agreement and shall be binding upon all parties to the Agreement.

(j) Site Preparation. [P]

The Library shall, at its own expense, prepare the site(s) to house the computer equipment in accordance with the installation specifications presented in the Vendor proposal or supplied to the Library not less than sixty (60) days prior to the scheduled delivery and installation date for the automated system. Site preparation shall be completed by the Library no less than ten (10) days prior to the scheduled delivery and installation date for the computer equipment. Upon completion of the site(s), Library shall notify Vendor (by certified mail, return receipt requested) that the site is completed and ready for inspection. Prior to the hardware delivery date, the Vendor shall provide a representative to physically inspect the site and, at the completion of that physical inspection, to provide a written statement of the results of this inspection. Should the library-prepared site be adequate, the Vendor written statement shall indicate that the site has been physically inspected and that the site meets the Vendor specifications for the proper and safe operation of the system. Should the site be inadequate, the Vendor shall itemize the specific problems and reference the correct requirements from the original site preparation documentation presented to the Library. The Library shall then have sixty (60) days to correct these deficiencies and shall provide written notice (by certified mail, return receipt requested) to Vendor that the site is available for re-examination. Should the Vendor fail to inspect the site according to the schedules presented in this Agreement, for either the initial inspection or the re-examination, where necessary, the Vendor shall be deemed by this Agreement to have approved site preparations and any subsequent site

changes necessary to install the scheduled system shall be totally the financial responsibility of the Vendor. Any and all changes or modifications to the preparation of the site resulting from inaccurate, incomplete, or erroneous specifications provided by the Vendor which result in added costs for correction or expansion of the site will be the responsibility of the Vendor and will be provided at Vendor expense. Should the Library fail to correct the deficiencies within the correction period, the Library shall be in default.

(k) Risk During Equipment Storage and Installation. [P]

Delivery shall be made in accordance with the implementation schedule referenced as part of this Agreement. It will be possible to allow for minor variances from this implementation schedule as mutually agreed upon by both parties and confirmed by prior written notice. The computer equipment and computer software shall be installed and placed into good working order by representatives of the Vendor. During the time period where the equipment is in transit and until the equipment is fully installed in good working order, the Vendor and its insurer shall be responsible for the equipment and relieve the Library of responsibility for all risk or loss or damage to the equipment. In addition, Vendor shall hold the Library harmless from any risk of loss or damage arising out of occurrences during the installation of the equipment. Recognizing that all equipment may not arrive in the same shipment, Library agrees to place the crated and packaged equipment in a secure, locked storage area pending installation by the Vendor.

(l) Shipping of Equipment. [P]

All shipping and insurance costs to and from the site shall be included in the vendor's proposal to the Library. All payments to shipping agents and for insurance fees shall be made directly by the Vendor and the Library shall make no payments to any firm concerning the shipment, installation and delivery of equipment which is not a part of this Agreement and for which exact payments are not described. Vendor shall be responsible for all arrangements for the shipment of equipment to the Library and movement of the equipment from the Library protective storage area to the prepared computer site. Recognizing that the Library staff have no prior experience or training in computer technology, the Vendor shall provide all properly trained representatives to unpack all items of equipment and place this equipment in the proper locations. The Vendor shall also be responsible for removal of all debris and packing materials from the Library site resulting from the installation of the equipment or the software/documentation. The Library, at its option, may require the Vendor to provide certificates describing, to the satisfaction of the Library, evidence of proper workmen's compensation and liability insurance for all Vendor staff and representatives involved in the installation of the computer equipment and software.

(m) Non-Waiver of Agreement Rights. [B]

It is the option of any party to the Agreement to grant extensions or provide flexibilities to the other party in meeting scheduled tasks or responsibilities defined in the Agreement. Under no circumstances, however, shall any parties to the Agreement forfeit or cancel any right presented in the Agreement by delaying or failing to exercise the right or by not immediately and promptly notifying the other party in the event of a default. In the event that a party to the Agreement waives a right, this does not indicate a waiver of the

ability of the party to, at a subsequent time, enforce the right. The payment of funds to the Vendor by the Library should in no way be interpreted as acceptance of the system or the waiver of performance requirements.

(n) Non-Collusion Covenant. [B]

The Vendor hereby represents and agrees that it has in no way entered into any contingent fee arrangement with any firm or person concerning the obtaining of this Agreement with the Library. In addition, the Vendor agrees that a duly authorized Vendor representative will sign a non-collusion affidavit, in a form acceptable to the Library, that the Vendor firm has received from the Library no incentive or special payments, or considerations not related to the provision of automation systems and services described in this Agreement.

(o) Patents, Copyrights, and Proprietary Rights Indemnification. [P]

The Vendor, at its own expense, shall completely and entirely defend the Library from any claim or suit brought against the Library arising from claims of violation of United States patents or copyrights resulting from the Vendor or Library use of any equipment, software, documentation, and/or data developed in connection with the services and products described in this Agreement. The Library will provide the Vendor with a written notice of any such claim or suit. The Library will also assist the Vendor, in all reasonable ways, in the preparation of information helpful to the Vendor in defending the Library against this suit. In the event that the Library is required to pay monies, in defending such claims, resulting from the Vendor being uncooperative or unsuccessful in representing the library's interest, or in the event that the Library is ordered to pay damages as a result of a judgement arising out of an infringement of patents and/or copyrights, Vendor agrees to fully reimburse the Library for all monies expended in connection with these matters. Library

retains the right to offset against any amounts owed Vendor any such monies expended by the Library in defending itself against such claims. Should a court order be issued against the Library restricting the Library's use of any product of a claim, and should the Vendor determine not to further appeal the claim issue, at the Library's sole option the Vendor shall provide, at the Vendor's sole expense, the following:

(a) Purchase for the Library the rights to continuing using the contested product(s), or

(b) Provide substitute products to the Library which are, in the Library's sole opinion, of equal or greater quality, or

(c) Refund all monies paid to the Vendor for the product(s) subject to the court action. The Vendor shall also pay to the Library all reasonable related losses related to the product(s) and for all reasonable expenses related to the installation and conversion to the new product(s).

(p) Nondiscrimination by Vendors or Agents of Vendor. [P]

Neither the Vendor nor anyone with whom the Vendor shall contract shall discriminate against any person employed or applying for employment concerning the performance of the Vendor responsibilities under this Agreement. This discrimination prohibition shall apply to all matters of initial employment, tenure and terms of employment, or otherwise with respect to any matter directly or indirectly relating to employment concerning race, color, sex, religion, age, national origin, or ancestry. A breach of this covenant may be regarded as a default by the Vendor of this Agreement.

(q) Escrow of Library System Software. [B]

The Vendor agrees to place in escrow, for the use, benefit, and protection of the Library, all software and changes thereon, and the source code of all software necessary to operate and keep current the system described by this Agreement. In the event that the Vendor withdraws support and maintenance of the software licensed under this Agreement, that the Vendor will be responsible to deliver, at least forty-five (45) days prior to the expiration of maintenance and support, all source code in escrow and any other software not yet posted by the Vendor to the escrow holdings. Withdrawal of the support and maintenance of the library's software system shall be construed liberally and, at a minimum, shall be defined as the Vendor ceasing operations, voluntarily or involuntarily, or dropping the system product lines described by this Agreement.

(r) Ownership of Data and Index Files. [P]

All parties to the Agreement acknowledge that the Library shall maintain ownership and control of all data files and the related indexes and pointers to those data files.

(s) Subcontractors. [B]

Vendors may use subcontractors in connection with the work performed under this Agreement. When using subcontractors, however, the Vendor must obtain written prior approval from the Library for activities or duties to take place at the Library site or with Library data or indexes. In using subcontractors, the Vendor agrees to be responsible for all their acts and omissions to the same extent as if the subcontractors were employees of the Vendor.

(t) Effect of Regulation. [B]

Should any local, state, or national regulatory authority having jurisdiction over the Library enter a valid and enforceable order upon the Library which has the effect of changing or superceding any term or condition of this Agreement, such order shall be complied with, but only so long as such order remains in effect and only to the extent actually necessary under the law. In such event, this Agreement shall remain in effect, unless the effect of the order is to deprive the Library of a material part of its Agreement with the Vendor. In the event this order results in depriving the Library of materials or raising their costs beyond that defined in this Agreement, the Library shall have the right to rescind all or part of this Agreement (if such a rescision is practical) or to end the Agreement term upon thirty (30) days written prior notice to the Vendor. Should the Agreement be terminated under such circumstances, the Library shall be absolved of all penalties and financial assessments related to cancellation of the Agreement.

(u) Assignments. [B]

The Library and the Vendor each binds themselves, their partners, successors, and other legal representatives to all covenants, agreements, and obligations contained in this Agreement.

(v) Vendor as Independent Contractor. [B]

It is expressly agreed that the Vendor is not an agent of the Library, but an independent contractor. The Vendor shall not pledge or attempt to pledge the credit of the Library or in any other way attempt to bind the Library.

(w) Insurance. [B]

The Vendor must have adequate insurance, for damage or loss, for all equipment and other valuables, until such time as the Library receives good and clear title. In defining insurance coverage, the Vendor shall secure full replacement value for the system -- without the requirement that the Library be responsible for any payments or deductibles. In the event that it is necessary to make a claim under this policy, any funds received by the Vendor shall be used to secure replacement equipment for the Library. The Vendor agrees to hold harmless and defend the Library and its agents, officials and employees from any liability, claim or injury, related to or caused by fault or negligence of Vendor employees or subcontractors. In order to demonstrate this responsibility, the Vendor shall furnish the Library with evidence of valid comprehensive general liability insurance coverage in the amount of $ AMOUNT for each occurrence for personal injury [including death or dismemberment] and property damage related to or resulting from shipping, installation, operation or removal of the proposed automated library system. The insurance policy shall make clear this coverage of the Library installation. The insurance policy shall be initiated prior to the installation of the system and maintained until final acceptance of the system by the library according to the prescribed procedures. The Vendor shall furnish to the Library a copy of the insurance policy and all subsequent changes or updates.

(x) Warranty of Merchantability. [P]

The Vendor warrants that the computer products, both hardware and software, are merchantable and fit for the ordinary purposes of which the products are normally used.

(y) Warranty of Fitness for a Particular Purpose. [P]

The Library has presented detailed descriptions of the particular purpose for which the automated system is intended. The Library has provided detailed quantitative descriptions and criteria of how the system can be defined to accomplish or failure the Library's particular purpose. The Library has also defined the exact procedures and techniques to be employed in testing whether the proposed system has achieved the defined performance of this particular purpose. Given this advanced preparation concerning and documentation about the Library's particular purpose, the Vendor at the time this Agreement is in force has

(1) reason and opportunity to know the particular purpose for which automated system products are required and

(2) that the Library is relying on the Vendors experience and knowledge of these products to provide those which are most suitable and appropriate. Therefore, the vendor warrants that the system is fit for the purposes for which it is intended as described in this document.

(z) Computer Hardware Expansion Responsibility. [M]

The Library has taken great care in projecting the transaction loads, terminal configurations and data storage loads anticipated for the system during the initial 60-months of operation. Should the computer hardware supplied by the vendor require any upgrade, enhancement, or extension solely to meet the levels of service defined for the initial 60-months, whether due to changes in software or inadequate initial planning, the Vendor shall provide the additional equipment [whether added, modified, or exchanged] to the Library at no charge. The Vendor shall also include all costs related to the shipping, insurance,

installation and other related costs necessary to bring the equipment into operation. All maintenance costs associated with this additional equipment shall be paid by the Vendor until the 60-month intial operation period has passed. At this time the Library will assume the responsibility for payment of equipment maintenance. The equipment provided to the Library under these circumstances shall become the property of the Library and the Vendor shall surrender title immediately after installation and testing. If installation of the addition or exchange equipment requires that the system be down and unable for normal operation, this time period shall be classified as 'unscheduled downtime' and will be used by the Library as part of the calculation necessary to determine system availability.

(aa) Software Warranty. [P]

The Vendor warrants that the software provided under this Agreement meets each of the specific requirements described in the Agreement. Should, after the date of formal acceptance of the system by the Library, errors be discovered, the Vendor warrants that the defects shall be corrected, without charge to the Library, for a period of one year (365 calendar days). This correction may take the formal of software additions, modifications, deletions or the provision of substitute software which meets the system functions as specified in this Agreement.

(bb) Unrequested Software Enhancements or Additions. [B]

Should the Vendor expand software functional or performance capabilities beyond those required as part of this Agreement, it is the option of the Library to accept or reject the installation and use of the software changes. Should the Library elect to install and use the added software functions or capabilities, the library shall be responsible for the costs associated with the

purchase, installation and maintenance of the computer hardware necessary to operate same. If the Library does not elect to install and use the software functions or capabilities, then such enhancements or improvements will not be required and the Vendor will continue to provide hardware and software maintenance as prescribed in this Agreement.

(cc) **Hardware Warranty.** [P]

The Vendor warrants that all equipment provided under this Agreement, whether installed initially or under subsequent purchase orders, shall be: newly manufactured equipment or assembled from newly manufactured parts; approved by Underwriter's Laboratories; and, will be free from detects in workmanship or material for a period of 6-months (180 calendar days) from the date of final system acceptance. During this 6-month warranty period, the Vendor shall furnish all replacement new parts, repaired parts, service labor and other repair costs at no cost to the library. At thje conclusion of the warranty period, the Library shall continue to secure Vendor support of equipment under a separate maintenance agreement.

(dd) Final Acceptance of the System. [P]

The automated library system proposed shall be defined to be finally accepted by the Library after the installation of the system, the load of the library databases and the successful completion of the follow performance examinations: system hardware examination; database load performance examination; functional competence examination; system storage capacity examination; system full load response time and processing capacity examination; and, system availability examination. Procedures for the administration and criteria for succussful completion of these examinations are found in attachments to the contract document.

(ee) Arbitration. [B]

In those situations where disagreements or disputes cannot be successfully resolved between the parties of this Agreement, the Library and the Vendor agree to the use of binding arbitration to settle the dispute. The parties of this Agreement agree to select and employ a professional arbitrator and conduct the conflict resolution process according to the rules and procedures of the American Arbitration Association. Both parties to this Agreement agree to equally share the professional fees and related expenses of the arbitrator and to abide by the directives resulting from the arbitration process.

(ff) Publicity [P]

Vendor agrees to submit to the Library all press releases, advertising, sales promotions, articles, and other publicity matters related to any product furnished by Vendor to the Library where in the Library name is mentioned, excluding the Vendor customer list and newsletter, Vendor shall not publish nor knowingly permit to be published any such material without the prior written consent of the Library.

(gg) Compliance With All Laws -- Partial Invalidity [B]

(a) Compliance. Each party agrees that it will perform its obligations herein in accordance with all applicable laws, rules and regulations now or hereafter in effect. Neither party shall have to take any action which would violate any applicable law, rule, or regulation of the controlling authority.

(b) Partial Invalidity. If any term or provision of this Agreement shall be found to be illegal or unenforceable then, notwithstanding, this Agreement shall remain in full force and effect and such term or provision shall be deemed stricken.

(hh) Rights to Peform Internal Teaching and Seminars [P]

Library shall have the right, so long as the System contracted for herein is in use by Library according to this Agreement, to give instruction to any or all Library personnel and patrons.

(ii) Ability to Modify Equipment in the Field [M]

Vendor represents that, in any case where expansion equipment can be installed or obtained through field modification of any component contracted for herein, Vendor will make such field installation when requested by Library at a rate not to exceed the rates charged by Vendor to third parties possessing a system comparable to the System during the calendar quarter when such field installation occurs.

(jj) Headings Not Controlling [B]

Headings and titles used in this Agreement are for reference purposes only and shall not be deemed a part of this Agreement.

(kk) Non-Hiring of Employees [P]

For the initial 24 months from the effective date of this Agreement, neither part to this Agreement shall employ staff of the other party. This prohibition shall be waived upon the following conditions:

(a) The new employer party provides 90 days notice prior to engaging the staff member of the current employer; and

(b) The new employer party reimburses the current employer party in an amount equal to one (1) year's salary/benefits, to cover the costs of training, education, and experience of the employee while a staff member of the current employer party.

(ll) Litigation Costs [B]

If litigation occurs, losing party pays attorney fees and cost.

TESTS
EVALUATING THE PERFORMANCE OF THE OPAC

1. TYPES OF PERFORMANCE TESTS:
   - 1.1 Functional Performance Examination. [Includes search result 'recall/precision' evaluation]
   - 1.2 System Reliability Examination. [Also called 'Availability Examination']
   - 1.3 System Data Load Examination.
   - 1.4 System Full Load, Response Time Performance Examination.
   - 1.5 System Storage Capacity Examination.
   - 1.6 System Training Program Evaluation. [Optional exam supported by some vendors]

2. PURPOSES OF THE OPAC EVALUATION PROCEDURE:
   - 2.1 Initial system acceptance.
   - 2.2 Ongoing system performance evaluation.
   - 2.3 Consistent method of evaluating OPAC behavior over time.

3. TEST 1: FUNCTIONAL PERFORMANCE EVALUATION.
   - 3.1 Confirmation that all contractually specified search and inquiry functions are available.
   - 3.2 Confirmation of system/user interface features are present.
   - 3.3 Confirmation of search results.
   - 3.4 Establish procedures and quantitative criteria for subsequent applications of the test.
     - ☐ Sequential testing of each function in the RFP/vendor response [more comprehensive]
       - Use of transaction scripts
       - Impromptu transactions
       - Functions not initially available [statistical historical counters, etc.]
     - ☐ Monitoring of actual operation conditions [less comprehensive]
     - ☐ Establish method to document non-compliance.

4. TEST 2: SYSTEM RELIABILITY EXAMINATION.

4.1 Confirmation of initial reliability of hardware for acceptance.

4.2 Confirmation of initial reliability of software for acceptance.

4.3 Criteria to measure the acceptability of ongoing reliability of hardware.

4.4 Criteria to measure the acceptability of ongoing reliability of software.

4.5 Establish procedures and quantitative criteria for subsequent applications of the test.

- ☐ Intervals of measurement (monthly, quarterly, annual)
- ☐ Formula defining the 'uptime' percentage
- ☐ Values or coefficients for each hardware device
- ☐ Values or coefficients for each software function.
- ☐ Use of spare devices in calculating downtime.

5. TEST 3: SYSTEM DATA LOAD EXAMINATION.

5.1 Confirmation of the ability to read and load retrospective bibliographic records.

5.2 Confirmation of the ability to read and load [interactively] new bibliographic records.

5.3 Confirmation of the proper indexing of the bibliographic records.

5.4 Confirmation of the proper loading and linking of item specific records/information.

5.5 Establish procedures and quantitative criteria for subsequent applications of the test.

- ☐ Use of test records -vs- actual records
- ☐ Criteria for evaluating speed of load times
- ☐ System activity during record load/index sequence

6. TEST 4: SYSTEM FULL LOAD, RESPONSE TIME PERFORMANCE EXAMINATION.

6.1 Confirmation of adherence to required response times for system acceptance.

6.2 Criteria to monitor and measure the acceptability of ongoing system responses.

6.3 Establish procedures and quantitative criteria for subsequent applications of the test.

- ☐ Test administration issues
  - Size of databases [what size must be loaded to simulate 'full load']

- Actual -vs- test databases
- Simulated transactions -vs- measurement of operation system activity
- Transaction mix [mix of OPAC and other functions]
- Use of transaction scripts [known hit values] -vs- impromptu transactions
- Impact of remote -vs- local terminal activity
- Functions not initially available [blocks, statistical histories, etc.]
- Simultaneous evaluation of individual terminals -vs- multiple terminals
- Simultaneous evaluation of selected transactions -vs- multiple transactions
- Test operator training and experience levels
- Length of testing period(s)

☐ Average response time -vs- peak response time

☐ Establish method to document non-compliance.

7. TEST 5: SYSTEM STORAGE CAPACITY EXAMINATION.

7.1 Confirmation of the ability of the system to support initial loaded/indexed databases.

☐ Definition of MARC indexing specifications

7.2 Criteria to monitor and measure planned growth of loaded/indexed databases.

☐ Documenting system expansion

7.3 Establish procedures and quantitative criteria for subsequent applications of the test.

Instructions for Completing Section "G": Definition of System Performance Requirements

The purpose of this section of the RFP is to present, in detail, the performance requirements that must be met for (a) the initial acceptance of the automated library system and (b) the ongoing operation of the system. These performance requirements will be incorporated into the final contractual agreement between the library and vendor. It is important that the vendor review these requirements and, in addition to all other information presented in the proposal packet, configure the proposed automated system hardware and software to successfully operate at the designated levels when exposed to these performance criteria. The tests presented herein are summary descriptions only. The exact procedures and techniques to be used to apply the tests will be defined in the contract.

Summary of Performance Examinations and Procedures to Be Required.

In order to be awarded the contract, the vendor must agree to provide an automated library system which can meet, where appropriate, the following seven (7) performance examinations. These performance examinations are described herein.

TEST 1: System Hardware Quality Examination.

After installation of the computer hardware at the library site [by vendor personnel], a hardware quality examination will be performed. This test must be conducted immediately upon the completion of the computer hardware installation. Designated library personnel must be present for the test. The hardware shall be continually tested for the duration of hours required by the original manufacturer for diagnostic testing, totalling up to a maximum of 72 hours, whichever is less. Upon completion of this test, the vendor has seven (7) calendar days to send written notice (certified mail, return receipt) that in the opinion of the vendor, the test has been successfully completed. The library and vendor will judge when this examination has been successfully performed. This examination will include a minimum of the following tests:

(a) Central processing unit(s) diagnostic test.

(b) Memory unit(s) diagnostic test (where applicable).

(c) Disk storage/controller unit(s) diagnostic test. [Including the writing of a disk file, the reading of a disk file, and the erasure of a disk file.]

(d) Magnetic tape drive unit(s) diagnostic test. [Including the writing of a file to tape, the reading of a file from tape, and the erasure of a tape file.]

(e) Alphanumeric terminal unit(s) diagnostic test.

(f) Line printer unit(s) diagnostic test. [Including a printer spray test.]

(g) Slave printer unit(s) diagnostic test. [Including a printer spray test.]

(h) Telecommunications unit(s) diagnostic test.

(i) Power loss/failure test.

Buyer will send notice to vendor after the successful completion of this test. This examination must be successfully completed as a condition of System acceptance.

TEST 2: Database Load Performance Examination.

Once the system equipment has been installed and the computer hardware tests successfully passed, the vendor should install all operating system and applications software. At this point in the system installation, the database load tests will be applied. There are two criteria which the system must accomplish to pass this examination:

(a) The system must be able to successfully load five (5) MARC records from the Library's bibliographic database from magnetic tape. In order for the load to be judged successful, data elements and resulting indexes must be properly constructed as described in the Request For Proposals and the Proposal.

(b) The system must be able to successfully transfer five (5) MARC records [OCLC local terminal to system interface] records from the OCLC bibliographic utility system. (Release as of effective date of this Agreement.)

Upon completion of this test, the vendor has seven (7) calendar days to send written notice (certified mail, return receipt) that in the opinion of the vendor, the test has been successfully completed. Once the system has successfully received and loaded records from both sources, the staff will perform a review of the transferred records to determine the error rate of the transfers. Should errors be found, the software and interface will be reviewed [and corrected] by the vendor and the test reapplied. This process will continue until no errors or transfer/load errors are detected. The library and vendor will be the sole judge of when this examination has been successfully performed.

This examination must be successfully comleted as a condition of system acceptance.

TEST 3: System Functional Competence Examination.

The System Functional Competence Examination is a test to determine if the required functional capabilities of the system are present and available for use.

Upon completion of the Bibliographic Load Examination, Vendor will demonstrate to Buyer the operation of each functional capability and the ability of the System to produce all printed reports and notices as required by the Buyer's Request For Proposals and the Vendor's responsive proposal.

If, during the testing process or within thirty (30) business days after the test, Buyer's staff observe variances from required functional requirements or system operational capabilities, Buyer will send notice of variance(s) to Vendor. Upon notice from Buyer, Vendor will correct the variances and an examination of these corrections will be performed by Buyer's staff. Should functional degradations remain after the correction period, Vendor shall be required to continue remedial actions necessary to correct the degradations. Once all variances have been corrected and confirmed by Buyer, Buyer will send notice of functional examination acceptance to Vendor.

This examination must be successfully completed as a condition of system acceptance.

TEST 4: System Storage Capacity Examination.

The System storage capacity examination is an ongoing quality examination requiring that Vendor provide a minimum storage capacity [while maintaining all other system performance criteria] based on the projected number of records for initial five (5) years of the system. Buyer does not have the expertise nor knowledge of proprietary information sufficient to allow for the prediction of storage capacity reqirements. It is required, therefore, that Vendor contractually guarantee that the levels of data specified (number of records with the defined indexed values) can be efficiently stored on the system.

The System shall be required to store the following number of bibliographic, patron, and item records, properly indexed, as described below:

(a) Bibliographic Records:	19___	_____	records
	19___	_____	records
	19___	_____	records
	19___	_____	records
	19___	_____	records
(b) Patron Records:	19___	_____	records
	19___	_____	records
	19___	_____	records
	19___	_____	records
	19___	_____	records
(c) Item Records:	19___	_____	records
	19___	_____	records
	19___	_____	records
	19___	_____	records
	19___	_____	records

Should the Buyer not have sufficient storage capacity, it shall be the responsibility of Vendor to provide, at their initial and ongoing expense, data storage devices sufficient to accomplish this.

TEST 5: System Full Load Response Time and Processing Capacity Examination.

The most difficult and controversial examination is the full load response time test (also called 'throughput test'). As with the functional competence test, the system full load response time and processing capacity examination is an ongoing test to determine if sufficient hardware and software resources have been provided by vendor to achieve the minimum levels of response time and processing capacity performance. This examination will remain in effect for the duration of the contract and remain the mechanism to establish and document acceptable and unacceptable system response time performance. While the exact procedures to be employed will be negotiated prior to signing the contract, the following criteria will be required:

(a) This test cannot be applied until such time as a minimum of 80% of the bibliographic, patron, and item databases have been loaded into and indexed, (according to MARC tags identified in the RFP) by the system.

(b) The library will prepare detailed transaction logs to be used by operators in performing the test. These logs will contain the exact transactions to be performed by each operator. These logs will be composed of a mix of transactions which the library feels will be comparable to the performance demands placed on this system for the time period indicated. Included in this mix will be functions pertaining to circulation, online public access catalog, technical services functions, etc. Vendors will be invited to participate in the creation of these transaction logs and lend assistance in combining the proper combination of transactions for each functional area (such as the mix of charge, discharge, renewal, hold, new patron, etc. for circulation). While vendors will be invited to make recommendations on the transaction mix, the library will have sole responsibility for the final transaction log mixtures. The probable mix has been listed at the conclusion of this test description.

(c) No test shall be deemed valid unless a minimum of 50 timings were performed at the monitored workstation for each type of transaction.

(d) There will be three (3) staffing levels necessary to perform the test.

These are:

Operators: Each designated workstation will be operated by a fully trained Library operator.

Monitors: Selected workstations will have monitor personnel to measure and record response times. All measurement must be taken with a stopwatch. Use of standard watches or clocks will not be permitted.

Jurors: Library managers, consultants, and vendor representatives will serve as system jurors. These individuals will be present to supervise the proper application of test procedures and to calculate the final results of the test(s).

(e) The monitor(s) will use 'Response Time Test Measurement Worksheets' to document all measured transactions. It is the responsibility of the monitor to correctly note on the form, prior to the application of the test, the following information:

1. The terminal location being measured.

2. The library location of the terminal being measured.

3. The type of terminal at which the measurement was taken.

4. The line speed, where applicable, to the terminal where the measurement is being taken.

5. The processor to which the terminal is connected during the measurement period.

6. Date.

(f) For each individual measurement observed by the monitor, the number of seconds required for the System to respond, shall be recorded to the nearest tenths of seconds.

(g) While a broad mix of transactions will be simultaneously performed on System terminals, only one terminal at a time shall be officially monitored and logged. Monitoring of timings shall not begin until after 10 minutes of active use of the system. No function monitoring shall cease before a minimum of 5 minutes of transaction monitoring has been performed.

(h) All transactions performed during the test, whether at a monitored or unmonitored workstation, shall be according to the prescribed transaction logs. No spontaneous transactions will be attempted during the test period by any operator.

(i) Library and vendor will jointly create and approve all transaction logs prior to the application of the examination.

(j) The final results will be calculated by the Library staff. Vendor representatives will be allowed to verify the test findings.

(k) The full load performance mix transaction logs [terminal functions and transaction types] will be as follows:

1. _____ terminals performing circulation transactions.

1.1 Charge function. Each of these _____ terminals will be scheduled to charge out an average of 5 Library items per minute. Each patron will be borrowing either 2 or 3 items.

1.2 Renewal function. Transaction logs will be designed to initiate and include one renewal transaction for each 5th patron charging out materials.

1.3 Patron card renewal function. Transaction logs will be designed to initiate a patron card renewal procedure for every 25th patron which charges out materials.

1.4 Fine posting transactions. Transaction logs will be designed to initiate a fine posting every 15th charge transaction.

1.5 Hold transactions. Transactions will be designed to initiate a hold request every 40th charge transaction.

1.6 Charge block function. Transaction logs will be designed to initiate a block of the charge function every 50th charge transaction.

2. _____ terminal performing circulation discharge transactions.

2.1 Discharge function. The terminal will be scheduled to discharge an average of 15 Library materials per minute.

2.2 Overdue posting. Transaction logs will be designed to where every 25th discharge will require the posting of an overdue fine to the patron record.

2.3 Fine payment. Transaction logs will be designed where every 30th discharge will post a fine payment to the appropriate records.

3. _____ terminal performing patron inquiry and registration transactions.

3.1 Patron registration function. Transaction logs will be designed where the terminal will perform a specified number of patron registrations.

3.2 Patron inquiry function. Transaction logs will be designed where the terminal will perform a specified number of patron record inquiries which will display patron information, Library materials charged out, and fines paid/pending.

4. _____ terminal performing technical services and database maintenance transactions.

4.1 Bibliographic database inquiry function. Transaction logs will be designed where the terminal is performing an average of one (1) bibliographic record inquiry per minute.

4.2 Bibliographic database update function. Transaction logs will be designed where the terminal is performing an average of one (1) bibliographic record inquiry per minute.

4.3 Bibliographic database add function. Transaction logs will be designed where the terminal adds a new bibliographic record every 20th bibliographic record viewed.

4.4 Item record database add function. Transaction logs will be designed where the terminal adds an item record to every 10th bibliographic record viewed.

5. _____ terminals performing online public access catalog transactions.

5.1 Title and author inquiry function. Transaction logs will be designed where _____ terminals are performing an equal mix of _____ OPAC title inquiries (50%) and OPAC author inquiries (50%).

5.2 Subject inquiry function. Transaction logs will be designed where _____ terminals are performing single logical search argument (as contrasted with boolean search arguments) subject inquiries.

5.3 Boolean inquiry function. Transaction logs will be designed where _____ terminals are performing boolean inquiries, composed of any two of all possible indexed data elements.

6. The printing of selected notices or management report.

(l) Response time shall be defined as the duration of seconds from when the operator initiates the transaction (hits the 'ENTER' or 'RETURN' key; OCR wanding, lightpen wanding, or laser wanding of an optical label; pressing a touch screen area) and when the System displays the first character of meaningful data or responds with a meaningful audible tone. "Average Response Time" is the value resulting from (a) adding the number of seconds of all monitored transactions and (b) dividing this total by the number of transactions. "Maximum Response Time" is the value resulting from (a) adding the number of seconds of the highest (in seconds) 5% of the monitored transactions and (b) dividing this total by the number of transactions which made up the 5% total.

(m) Boolean key word searches shall exclude the top 1% most frequent occuring words and all words in the stop list.

(n) In order for the System to successfully pass this examination, it must fully achieve the following response times:

Response Time Chart

Transaction Type	Average Response Time	Maximum Response Time
1. Checkout [patron or item bar code]	2.0	3.0
2. Checkin [item bar code; no alert]	3.0	4.0
3. Checkin [item bar code; alert]	2.0	4.0
4. Renew item [item bar code]	2.0	3.0
5. Place hold	3.0	3.5
6. Register new patron [record storage (patron record)]	3.0	5.0
7. Renew patron registration [bar code]	3.0	5.0
8. Title inquiry [title key]	2.0	3.0
9. Patron inquiry [patron ID number]	2.0	3.0
10. Patron inquiry [patron name]	3.0	5.0
11. Item inquiry [item ID number]	2.0	3.0
12. Add new bibliographic record to database [record storage (new title)]	4.0	7.0
13. Add new item record to database	3.0	5.0
14. OPAC title search [browse]	3.0	5.0
15. OPAC keyword search [one term]	6.0	8.0
16. OPAC keyword search (two terms)	6.0	8.0
17. OPAC author search (keyword)	3.0	5.0

TEST 6: System Availability Examination.

The System Equipment Reliability Examination is an examination to determine if the Equipment provided under this Agreement is reliable and, therefore, suitable for use by the Buyer. Successful completion of this examination is necessary for System acceptance.

This examination will be administered as follows:

(a) Upon receipt by the Buyer from Vendor of (a) notice of the successful completion of the Hardware Quality Examination, Database Load Performance Examination, and Functional Competence Examination, and (b) after the operational control of the system passes to the Buyer, Buyer staff shall initiate the calculations necessary to perform the Equipment Reliability Examination.

(b) The Equipment Reliability Examination may be overlapped with other performance examination procedures.

(c) In order to successfully pass this examination, the Equipment must be available for 99% of the business hours of Buyer during a 60-day continuous time period.

(d) All downtime shall be measured in increments of 6 minutes, rounded to the nearest (up or down) increment. In calculating downtime, each occurrence shall be measured, calculated separately, and logged into the operations downtime transaction log. At the conclusion each 60-day examination period, the downtime value resulting from each occurrence will be combined to arrive at the total amount of downtime. Under not circumstances will the downtime coefficient value more than 1.0 in calculating the minutes of downtime.

The formula for calculating each occurrence of downtime is as follows:

FORMULA: $(t) = (d) \times (m)$

[where variables are defined as:]

(d) = downtime coefficient value

(m) = number of minutes of downtime

(t) = total downtime [for that occurrence]

(e) The downtime coefficient value shall be assigned according to the following table:

Class 1 Hardware Outage: Coefficient Value = 1.0 [each device]

- Central processing unit
- Disk drive(s)/controller
- Operations console

EXAMPLE

- Main memory

Class 2 Hardware Outage: Coefficient Value = 0.50 [each device]

- Line printer
- Tape drive

Class 3 Hardware Outage: Coefficient Value = 0.10 [each device]

- Terminals
- Optical scanning device
- Slave printer
- Portable optical reader/portable terminal
- Modems/MUX
- Any other vendor supplied equipment

(f) The buyer has primary responsibility for maintaining the downtime log. The vendor, however, will be encouraged to maintain a separate downtime log.

(g) Downtime is defined as the amount of time from the minute the vendor is notified of the occurrence and the moment that the outage is successfully resolved. This excludes holidays and other times when the buyer is officially closed. No downtime calculation will be made on any device for which the vendor has provided a spare device. At that point when all spare devices provided by the vendor are in use and additional Buyer devices are inoperative, a downtime amount will be assigned to additional Buyer devices which are inoperative.

(h) During the testing period, all scheduled preventative maintenance dowtime shall be excluded from the calculation. All downtime due to power failures shall be excluded from the calculation. All downtime due to improper air conditioning shall be excluded from the calculation. All downtime due to Buyer's staff (operator) error shall be excluded from the calculation.

After successful completion of 99% availabiliity for the 60-day continuous test period, Buyer will send notice to vendor of successful performane of this examintion. This examination must be successfully completed as a condition of system acceptance.

DEFINING 'TRANSACTION MIX' FOR FULL LOAD TESTS
[and how this changes performance]

MIXTURE A

TRANSACTION MIX 'A'

Charge/Renewal	40%
Discharge	40%
Inquiry	15%
Input/Update	5%

RESPONSE TIMES

TRANSACTION TYPE	AVERAGE RESPONSE TIME	PEAK RESPONSE TIME
Charge/Renewal	2-4 seconds	4-6 seconds
Discharge	2-4 seconds	4-6 seconds
Input Functions	2 seconds	3 seconds
Patron Update	2 seconds	3 seconds
Item Update	2 seconds	3 seconds
Bibliographic Update	2-4 seconds	4-6 seconds
Queries [simple]	2-4 seconds	4-6 seconds
Searches [item or keyword]	2 seconds	4-6 seconds
Boolean [dependent on number of items]	2 seconds	4-6 seconds

DEFINING 'TRANSACTION MIX' FOR FULL LOAD TESTS
[and how this changes performance]

MIXTURE B

TRANSACTION MIX 'B'

Charge/Renewal	20%
Discharge	15%
Inquiry	60%
Input/Update	5%

RESPONSE TIMES

TRANSACTION TYPE	AVERAGE RESPONSE TIME	PEAK RESPONSE TIME
Charge/Renewal	2-4 seconds	4-6 seconds
Discharge	2-4 seconds	4-6 seconds
Input Functions	2 seconds	3 seconds
Patron Update	2 seconds	3 seconds
Item Update	2 seconds	3 seconds
Bibliographic Update	2-4 seconds	4-6 seconds
Queries [simple]	2-4 seconds	4-6 seconds
Searches [index]	2 seconds	4-6 seconds

[BOOLEAN SEARCH IS REMOVED FROM LIST]

DEFINING 'TRANSACTION MIX' FOR FULL LOAD TESTS
[and how this changes performance]

MIXTURE C

TRANSACTION MIX 'C'

Charge/Renewal	5%
Discharge	5%
Inquiry	25%
Input/Update	65%

RESPONSE TIMES

TRANSACTION TYPE	AVERAGE RESPONSE TIME	PEAK RESPONSE TIME
Charge/Renewal	3 seconds	4-6 seconds
Discharge	3 seconds	4-6 seconds
Input Functions	3 seconds	4-6 seconds
Patron Update	3 seconds	4-6 seconds
Item Update	3 seconds	4-6 seconds
Bibliographic Update	4-6 seconds	4-6 seconds
Queries [simple]	3 seconds	4-6 seconds
Searches [index]	3 seconds	4-6 seconds

[BOOLEAN SEARCH IS REMOVED FROM LIST]

REMEDIES
WHAT TO DO WHEN THE OPAC FAILS THE TEST(S)

1. TRADITIONAL REMEDIES:

1.1 Before system contract is signed...

- ☐ Evaluate OPAC performance in a 'comperable' site [database, transaction mix, etc.]

1.2 Once the system has been contracted, but before the system is paid for.....

- ☐ Withhold payment from the vendor
- ☐ Reject vendor; remove system from library and select different system.
- ☐ Announce [to professional literature] that system fails to meet acceptance criteria

1.3 Once the system has been contracted and paid for...

- ☐ Liquidated damages
- ☐ Seek to enforce performance bond against vendor
- ☐ Litigation [including mediation and/or arbitration]

1.4 Commonly proposed solutions offered by the vendor to improve performance...

- ☐ Maintenance discounts in proportion to inadequacies of system performance
- ☐ Change testing procedures
- ☐ Change values required to successfully pass the test
- ☐ Suspend further testing, pending new release of the software
- ☐ Add additional computing resources to the central computer site
- ☐ Alter values included as part of indexing system
- ☐ Reduce size of database engaged during testing procedures
- ☐ Abandon certain testing standards [which cannot be passed] in favor of alternates [which can be passed]; for example, abandon 'peak load' and rely on 'average load' measurements.
- ☐ Waive selective portions of testing requirements which cannot be passed.

2. EXPERIMENTAL REMEDIES:

2.1 Before system contract is signed....

- ☐ Perform comprehensive benchmark tests; at comperable site or using computer simulation

2.2 Once the system has been contracted and paid for...

- ☐ 'Failure to perform' contract language
- ☐ System correction SWAT teams

HOW GOOD ARE MAINTENANCE DISCOUNTS [CREDITS] AS A REMEDY FOR SYSTEM RELIABILITY?

In the event that the System fails to perform to an effectiveness level of ninety five (95) percent or more during any consecutive three (3) month period during the term of this Agreement, then CLSI shall grant a maintenance credit to the Customer in an amount determined by subtracting the actual effectiveness percentage level from ninety five (95) percent and multiplying by two (2). For example:

Actual Effectiveness	Credit
95%	0%
94%	2%
93%	4%
90%	10%
85%	20%

EXAMPLE

Effectiveness level is defined to be the time during normal library working hours when the system is capable of performing the basic checkin/checkout transactions divided by the total time the System is scheculed to be used by the Customer.

The maximum maintenance credit shall not exceed fifty (50) percent of the total Basic Monthly Charges for the quarter for which the credit is being requested. This penalty clause may only be exercised if the System effectivity level is below ninety five (95) percent solely as a result of CLSI's failure to perform its obligations hereunder.

EXAMPLE SITUATION: University XYZ Library

Assume.....

1. Total hours open each week = 87hrs [9:00am - Midnight, M-T; 9:00am - 6:00pm, F-Sun]
2. Total monthly maintenance payments = $4,120.00 [Single contract for hardware/software]

Actual Effectiveness of OPAC:	Total Hours DOWN that quarter: [quarter = 13 weeks]	Total Maintenance Credit That Quarter:
95%	56.55 hrs [5% down]	$ 0.00
94%	67.86 hrs [6% down]	$ 247.20
93%	79.17 hrs [7% down]	$ 494.40
90%	113.10 hrs [10% down]	$ 1,236.00
85%	169.65 hrs [15% down]	$ 2,472.00

Example Payment Schedules Offered by Vendors

4.3. Payment. Institution shall pay OCLC the purchase price as follows: (i) an initial payment of twenty-five percent (25%) of the purchase price on the Effective Date of this Agreement; (ii) a second payment of fifty percent (50%) of the purchase price within ten (10) days after written OCLC notice to Institution that the Equipment Acceptance Test, referred to in paragraph 1 of Exhibit 4.1 to this Agreement, has been successfully completed, and (iii) the balance of twenty-five percent (25%) of the purchase price within ten (10) days after final acceptance, as defined in such Exhibit 4.1. Charges for products and services described in Section 2.6.1 shall be paid upon completion of such services and delivery of such products within thirty (30) days after date of invoice from OCLC. Payment for all other charges shall be made within thirty (30) days after date of OCLC invoice. If Institution rejects the System as provided for in Section 4.1 of this Agreement, OCLC shall promptly refund to Institution that portion of any payments already made by Institution, except for payment with respect to separately accepted products and services described in Section 2.6.1 of this Agreement, provided that Institution has met its obligations in connection with return of the System under Section 4.1.2 of this Agreement. Final payment and acceptance by Institution shall constitute a release by Institution of OCLC from all claims under this Agreement with respect to the System and services for which such payment is allocated.

13. Terms of Payment

Payment is due no later than ten (10) days after each of the following milestones in the percentages of the Purchase Price specified:

Execution of this Agreement	20%
Notification of Shipping	30%
Functional Demonstration	40%
Performance Test	10%

If CLSI should be directed not to ship the Equipment because of failures on the part of Buyer, or the Buyer's contractor, or should CLSI be unable to install the System because of such failures or should CLSI be unable to perform the functional demonstration because of such failures, the Buyer will pay CLSI the entire Purchase Price immediately. If payment is not received by CLSI within ten (10) days after each of the above milestones, the Buyer shall pay CLSI an interest charge of 1½% per month until the payment is received.

OPAC Research -- What We Have Learned...

1. USER HABITS & BEHAVIOR:

1.1 Users prefer the online catalog to any other form of the catalog [card, book, or COM].

- ☐ Most users prefer the OPAC, even if it is crude and even if they know it is incomplete and less accurate. [Moore]
- ☐ Only 50% of users would try card catalog if search attempts on the OPAC failed. [Alzofon/ Van Pulis]
- ☐ 72% found OPAC easier to use than card catalog. [Pauley]
- ☐ 85.4% found OPAC easier to use than card catalog or COM. [Dowlin]
- ☐ 90% of users prefer OPAC, even when it is less accurate. [Gourke/ Peas[illegible]

1.2 Users desire more formal training and written instructional materials ????

- ☐ 85% of users requested more training and documentation. [Pritchard]
- ☐ Users did not identify additional training and documentation as priority issues. [Broadus]
  [Requested online assistance only]
- ☐ Formal classes and workshops have no significant effect on search success. [Alzofon/ Van Pulis]
- ☐ User success increased with online, interactive tutorials and help facilities. [Siegel]
- ☐ Users with formal education and training are more successful and satisfied users of the OPAC. [Matthews/ Lawrence]

OPAC Research -- What We Have Learned...

[Continued]

1.3 Users place the highest priority on subject searching.

- ☐ Most users want access to library materials by subject. [Most studies]
  [Studies confirming this include Pritchard, Moore, Pauley, Norden/Lawrence, Gourke/Pease, Kaske/Sanders, Seal, Bishop, Broadus, Matthews/Lawrence, and Mandel/Herschman]
- ☐ 69% of users relied primarily on subject search [Pritchard]
- ☐ Users search by title approximately 33% of the attempts. [Norden/ Lawrence]
- ☐ Users requested that additional subject headings be added to catalog records. [Kaske/ Sanders]
- ☐ Users prefer keyword search capability. [Many studies]
  [Studies confirming this include Geller/Lesk, Kaske/Sanders, Broadus, Mandel/Herschman]
- ☐ Users search by author less than 10% of the attempts. [Norden/ Lawrence]

1.4 Users have some difficulty using the LC subject heading entries to search the OPAC.

- ☐ Many users found it difficult to search traditional LC subject headings. [Pritchard]
- ☐ Major problems in subject searching were linked to problems with the LC subject headings. [Alzofon/ Van Pulis]
- ☐ Only 28% of users realized that LC subject headings were required; most patrons tried to search with non-LC values. [Steinberg/ Metz]

OPAC Research -- What We Have Learned...

[continued]

2. WHY DO USER SEARCHES FAIL ?

2.1 Of failed author searches examined:

- ☐ 40% failed due to searcher failure to invert author name. [Tolle]
- ☐ 10% failed due to incorrect entry of forenames or initials. [Tolle]
- ☐ 33% filed due to incorrect spelling of surnames [Tolle]

2.2 Of failed title searches examined:

- ☐ 50% failed due to properly structuring search statement. [Tolle]
- ☐ Many users fail due to message idiosyncrasies. [Gourke/ Peese]
- ☐ Fails were also linked to inability of searcher to adhere to cataloging rules for how to enter numbers and abbreviations. [Tolle]

2.3 Other problems in failed searches examined and unusal user behavior:

- ☐ OPAC users continue to have a high number of aborted searches. [Hildreth]
- ☐ 13% of all failed searches can be traced to typographical errors. [Borgman]
- ☐ Monitored system searches show a modest number of searches where search results were never reviewed by user. [Hildreth]

OPAC Research -- What We Have Learned...

[continued]

3. OTHER OUTCOMES OF OPAC RESEARCH:

3.1 Patrons have major misconceptions about the OPAC as compared to the card catalog.

- ☐ 43% of users did not know what was represented in the OPAC [% of total library holdings, special collections, quality of data records, etc.] [Steinberg/ Metz]
- ☐ Most users attribute to the OPAC 'powers of intrepretation' which they do not attribute to the card catalog. [Tolle]
- ☐ Most users perceive that the OPAC is 'forgiving' of user error and inconsistency in searching. [Tolle]

3.2 Success 'sterotypes, such as patron OPAC experience did not result in increased search success.

- ☐ Patron attitude, not experience on the system, was the primary attribute to increasing search success. [Alzofon/ Van Pulis]
- ☐ There was no significant success difference of searchers because of age or frequency of library use. [Dowlin]

3.3 Patron use of the OPAC increases as users become more familiar with the system.

- ☐ During 30 months, online inquiry transactions increased 219%. [Norden/ Lawrence]

3.4 Users desire to use the OPAC from home and the work place.

- ☐ 75% of users want to access the OPAC from home. [Dowlin]

OPAC Research -- What We Have Learned...

[continued]

3.5 Other general findings of interest:

- ☐ Users want more terminals. [Pauley]
- ☐ Increased number of terminals; at more convenient locations. [Broadus]
- ☐ Most of the bibliographic information is rarely used. A subset of information would be adequate, but must include title, author, call number, subject, name added entry, subject added entry. [Seal]
- ☐ OPAC search capabilities will define what users bring to search; once keys are known, user will gather that information prior to search. [Bishop]
- ☐ Users want location and information provided in search results. [Broadus]
- ☐ Patrons want status information. [Steinberg/ Metz]
- ☐ Seated patrons search longer than standing patrons. [Borgman]

OPAC Research -- What We Have Learned...

[continued]

4. FUTURE OPAC RESEARCH -- WHAT NEEDS TO BE DONE ? [1]

4.1 How can online subject access to library materials and the information they contain be improved and expanded ?

4.2 How can we create user-system interfaces that are more natural, helpful, and adaptive to a variety of users ?

4.3 What search approaches, methods, and features are effective for various tasks and classes of users ?

4.4 What functions of authority control are needed in the online search environment, and how are they best implemented ?

4.5 What kind of user education and training is needed as online catalogs replace manual catalogs ?

[1] List prepared by Charles R. Hildreth, READ, Inc.

Determining the Number of OPAC Terminals

1. "Cannot be accurately predicted..."
   - ☐ Problem variable: physical layout of the library facility.
   - ☐ Service emphasis of the collection and library institution
   - ☐ Library staffing [too little, too much, emphasis on reference, emphasis on branches...]
   - ☐ Type of library [academic, public, urban, rural...]

2. John Tolle Study on OPAC Queuing [OCLC Research Project]
   - ☐ No correlation of OPAC queuing to 'number of persons checking out books'
   - ☐ No correlation of OPAC queuing to 'number of reference activity transactions'
   - ☐ No correlation of OPAC queuing to 'library gate count'
   - ☐ Possible correlation in using a 'combination of library attributes'
   - ☐ Possible correlation in using 'number of books circulated'

3. 'Street Smart' and 'Automation Folklore' Guidelines
   - ☐ 1 OPAC terminal per 100 daily patron count
   - ☐ 1 OPAC terminal per 200 daily patron count
   - ☐ 1 OPAC terminal for each circulation terminal
   - ☐ 2 OPAC terminals for each 1 circulation terminals
   - ☐ 8-10 OPAC terminals for each OCLC terminal
   - ☐ 1 OPAC terminal per 25,000 annual circulation [public libraries]

4. Dial-in OPAC Users
   - ☐ 1 OPAC dial-in port per 500 registered remote users
   - ☐ Get a queuing estimate from the telephone utility concerning 'busy signals'