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REPORT ON

FEASIBILITY STUDY FOR AUTOMATION

OF

UNIVERSITY OF THE PHILIPPINES LIBRARY SYSTEM

Performed by

Mary Jane Ruhl
Consultant
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Submitted to

Dr. Augustin Kintanar, Jr.
Vice-President for Planning and Finance
University of the Philippines
Diliman, Quezon City
Philippines

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I. INTRODUCTION

The University of the Philippines (UP) Library System consists of the following:

- o Diliman Campus: Main Library and 22 unit libraries;
- o Baguio Campus: Library (administered by Diliman Main Library);
- o Los Banos Campus: Library and seven unit libraries;
- o Manila Campus: Medical Library and seven unit libraries;
- o Visayas Campuses: Iloilo, library and three unit libraries; Cebu, two libraries; Tacloban, two libraries;
- o San Fernando Extension: One library (administered by Main Library, Diliman).

The library system's holdings are approximately 900,000 volumes. Currently the library is implementing a foundation grant of $900,000 for the acquisition of new books and journals.

As in any large library system that is operated manually, duplication of effort requires an inordinate amount of staff time. The services that can be offered to students and faculty are dictated by the amount of staff time that remains after the basic activities are performed. The centralized processing-decentralized service configuration of the library system requires a high level of coordination to ensure that all work is performed and the results are shared to the greatest possible extent. In a manual system quality control is especially time-consuming because some operations may be subject to omissions and inconsistencies that are more easily prevented by automated procedures.

The library system currently provides, as efficiently as is feasible, a full range of library services: card catalogs and serials files, basic reference service, reserve sections, lending service, and new acquisitions lists that are prepared two to four times a year. However, the volume of materials processed by current staff leaves little time to provide searching or selective dissemination of information (SDI) to faculty and students. In addition, staff reductions in recent years have resulted in a large backlog of items to be cataloged and indexed.

The UP administrators and faculty members show keen interest in all aspects of the library's operation and services. The administration has recognized the need to improve the current

library system, as part of their continuing efforts to upgrade the university's learning facilities. Improvements should result in the following:

- Expanding library services,
- Containing operational costs during expansion,
- Increasing technical processing efficiency,
- Improving the capability to share information between and among the various campuses and units,
- Facilitating standardization throughout the library system,
- Keeping up with the imminent increase in processing and service related to the grant of funds for new books and journals, and
- Processing the current backlog.

The improvements eventually might be realized if the manual system were maintained and library staff were increased, perhaps doubled. Alternatively, the improvements could be achieved probably sooner by introducing automation into the library system with fewer additional staff required.

In light of these alternatives, the administration further recognized the timeliness of automation, including:

- The current state of technology, i.e., the continuing improvements in the capability and capacity of computers and the relative decrease in their prices;
- The relative sophistication of library personnel and their readiness for automation;
- The strong capabilities and cooperative attitude of the Computer Center staff;
- Current plans to upgrade the computing facilities at the Computer Center as well as increased acquisition of microcomputers throughout the university.

Based on the above considerations, this two-month study was performed to determine the feasibility of computerization of the UP library system. This project has been funded by the U.S. Agency for International Development, Mission to the Philippines, under Contract No. AID 492-0249-C-00-6048-00.

II. THE UP LIBRARY SYSTEM

A. Overview

The UP Library System is depicted in Exhibit 1, which shows the libraries' relationships and the activities performed by each. Appendix A shows the Library System's organization charts.

During the study all campuses (except San Fernando) were visited. Persons interviewed at those campuses included all Chancellors, several Deans, and all librarians of campus or unit libraries, with the exception of two unit libraries at Los Banos whose interests were represented by the Los Banos librarian.

In conducting the interviews, the following points were discussed:

- o Current availability of computers
- o Plans for acquiring computers
- o Familiarity of library staff with computers
- o Current status of localized library automation activities
- o Specific recommendations for library functions to be automated and review of procedures that might be improved by automation.

B. Availability of Computers and Plans for Computer Acquisition

The following description of computer availability includes maxi- and minicomputers (both of which could serve as mainframes) and IBM PC-compatible microcomputers. Apples, TRS's, etc. were not counted. While they may support a number of administrative functions in the libraries, they do not support the software required for library automation. (Reference is made to some libraries' uses of Apples and TRS's.)

Diliman Campus

Computer Center: IBM 370 mainframe and peripherals
(IBM 4341 is being considered)
10 IBM PC/XT compatibles

Main Library: 1 IBM PC/XT compatible

Unit Libraries: Economics Library: 1 IBM PC/XT compatible

Law Library: 2 IBM PC/XT (1 compatible)

DILIMAN CAMPUS LIBRARIES

Diliman Main Library performs:

Ordering**
Cataloging**
Indexing**
Accessioning*
Catalog maintenance (UC)***
Serials Control**
Circulation*
Readers Services*
User Training**

AUTONOMOUS CAMPUS LIBRARIES

Manila and Los Baños Libraries perform:

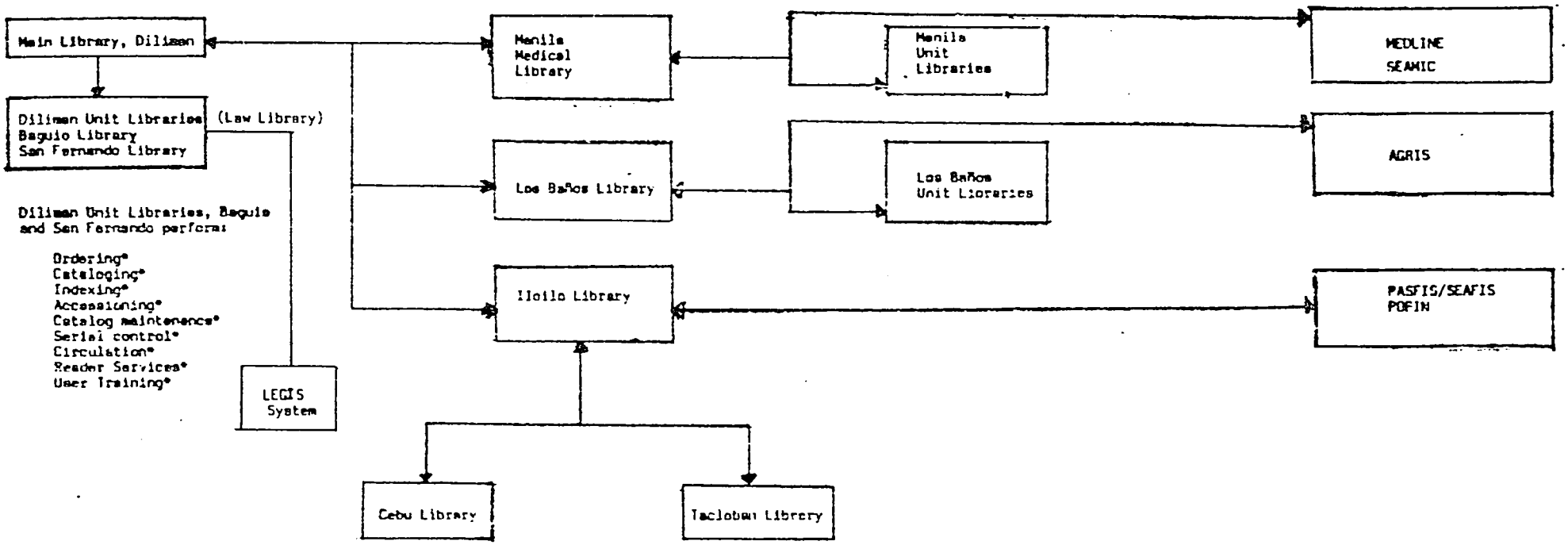
Ordering**
Cataloging**
Indexing**
Accessioning*
Catalog maintenance**
Serials Control*
Circulation*
User Training*

AUTONOMOUS CAMPUS UNIT LIBRARIES

Autonomous Unit Libraries perform:

Catalog maintenance*
Serial Control*
Circulation*
Reader Services*
User Training*

INTERFACE WI... EX...



Diliman Unit Libraries, Baguio and San Fernando perform:

Ordering*
Cataloging*
Indexing*
Accessioning*
Catalog maintenance*
Serial control*
Circulation*
Reader Services*
User Training*

Iloilo Library performs:

Ordering for Iloilo, Cebu and Tacloban, and maintains a catalog of all 3 campuses' holdings

Iloilo, Cebu and Tacloban perform:
Ordering*
Cataloging*
Indexing*
Accessioning*
Serial control*
Circulation*
Reader Services*
User Training*

*For own library
**For own library
***For own library

Exhibit 1

UP LIBRARY SYSTEM
RELATIONSHIPS AMONG LIBRARIES AND FUNCTIONS PERFORMED

Institute of Library Science: 2 IBM PC/XT compatibles

8 other departments have IBM PC/XT compatibles but libraries may not be allowed to use them

3 libraries or their departments have ordered or will order IBM PC/XT compatibles

other libraries or their departments have no plans to order microcomputers.

Baguio Campus: 2 IBM PC compatibles in computer room, may be used by library staff; plan to acquire IBM PC/XT compatible for library.

Los Banos Campus

Computer Center: IBM 370/135; 512 K & 500 Mb + 7 terminals NCR Tower (plan to get IBM 4341)

Library HP Vectra (IBM-compatible)

Forestry Library: Social Forestry Library Project has IBM PC/XT compatible

National Crop Protection Center (NCPC): Micro HP 9845

Agrarian Reform Institute (ARI): IBM PC

Manila Campus

Each college has one IBM PC compatible; they plan to obtain a microcomputer for each department.

Medical Library: expects to obtain a microcomputer from SEAMIC (Japan), Philippine Center for Health and Research Development, or from U.P./Manila during FY 1987.

Visayas

Iloilo Campus: 6 IBM PC/XT compatibles; one is earmarked for the library.

Cebu Campus: 2 IBM PC/XT compatibles on order; none targeted for library use, but the computer room may be located in the library building, which will increase the possibility for the library's use of the computers.

Tacloban Campus: There are plans to order some IBM PC/XT compatibles. Currently the library has an Apple IIe that is being used for word processing and other local systems.

C. Library Staff Familiarity with Computers

Libraries whose staff had familiarity with computer use are as follows (not including librarians trained during this project):

Diliman:	Main Library	1 experienced 5 introductory training
	Inst. of Library Science	2 experienced
	Law Library	1 experienced
Los Banos:	Library	9 experienced
	Soc. Forestry Libr.	1 experienced
	ARI	1 experienced
	NCPC	1 experienced
Manila:	Medical Library	3 introductory training
Iloilo:	Library	4 experienced
Tacloban:	Library	1 experienced

D. Current Status of Localized Library Automation Activities

Some librarians have been planning for automation; some have begun using computers for specific routines. Current utilities developed in-house are as follows (list does not include basic use of word processing or spreadsheet systems for administrative purposes):

Diliman: Main Library - Database application programs and related databases via dBASE II/III: Personnel records, delinquent borrowers, subject authority list, desiderata file;

Spreadsheets via Lotus 1-2-3:
Library statistics summary - bookfund, expenses; bookfund status;

Various text files via Wordstar.

Inst. of Library Science - Circulation control (TRS)

Law Library - Index via dBaseIII
Developing LEGIS system for Supreme Court Decisions, etc.

Los Banos: Library - Uses terminal to prepare input to AIBA's HP3000 for Philippine Agricultural Bibliography; can retrieve and download from AIBA.

Social Forestry Library - Uses dBASE III program to prepare input to Philippine Agricultural Bibliography; can retrieve from their own files.

ARI - Uses dBASE III program to store library collection data that can be retrieved from their own files.

NCPC - Uses AIBA's HP 3000 for storing and retrieving information on Integrated Pest Management.

PHTRC - Uses Apple II computer for storing and retrieving library collection data.

E. Librarians' Recommendations for Automation

In looking into the possibility for their own libraries' automation, the librarians have identified the activities that should be automated system-wide. The consensus of all librarians visited was that the following should be automated:

- Selection, ordering, and acquisition
- Cataloging
- Indexing
- Serials Control
- Circulation control
- Reserve books
- Inventory

The recommendations have resulted from specific problem areas such as the following:

- Several of the unit libraries are staffed with only one to three persons. Constant interruptions by users make it difficult to perform certain activities. For example, preparing, proofreading, and finalizing a new acquisitions list may be done over a period of several weeks even though less time may be required to produce it. Preparing the lists must take second priority to serving the user who needs immediate attention. The current workload disallows additional services such as preparing specialized bibliographies or performing literature searches.

- Of special concern to all librarians is the mandatory annual inventory. An automated system would be used to facilitate inventory procedures.

These requirements and concerns were considered in identifying specific automation requirements that are described in the following section.

III. AUTOMATION REQUIREMENTS

Examination of the current procedures and related manpower shows that the library's activities are being carried out as efficiently as is feasible using a manual system.

Appendix B includes a set of flow diagrams and related activities for manual processing. Each diagram has been tagged to show the activities that can be automated.

A. General Requirements

An automated system would require all cataloging information to be prepared in machine-readable form, thus creating one database that could allow the full range of products to be printed out in minutes in response to simple commands.

The library system would be computer-assisted rather than fully-automated for the first several years of operation for the following reasons:

- Conversion of the entire catalog of more than 800,000 items into machine-readable would require many person-years of professional and clerical effort. Its feasibility should be considered only after current and 1980's cataloging has been converted.

- An entirely automated system would require terminals for library users as well as for library staff. This would require many terminals in the reading rooms. It would also require a major user education program.

- As long as power failures occur frequently, it is not practical to have an entirely electronically-driven system. The card catalog must be maintained in parallel with an automated system to allow full-time access to the catalog's records.

Fully-automated library systems that have abandoned their manual catalogs have been found to be impractical in many ways. Even a small degree of unreliability can frustrate librarians and users to an extent that outweighs their advantages. Their annoyance level approaches that experienced when airline reservation computer systems are "down".

An entirely automated system might become practical for UP during the next 10 years, if existing problems are solved, (e.g., unreliable power source, unsatisfactory telecommunications system, etc.). Also, during that period, technology certainly will become more powerful and less expensive if the current trend continues. It is likely that, even with those improvements realized, parallel manual files would be required to provide satisfactory service at all times.

General requirements are as follows:

1. Priorities for Input to Automated System - The data to be input to the system will include only the following: current acquisitions, material imprinted 1980 or later, and early material on a select basis. When that material has been input, the decision should be made as to whether earlier material should be added to the files. This decision should be made, based on the following:

- o Need for earlier material based on first two years' experience with automated system and user requirements for retrospective materials.
- o Available computer capacity (current or upgraded).
- o Availability of personnel.

It is likely that exceptions would be made, e.g., some smaller campus libraries and unit libraries have indicated their intention to prepare catalog input for their entire collections. Also, special collections, e.g., Filipiniana at the Main Library, might be input in their entirety.

2. Input Preparation - Input to the system should be prepared at Diliman Campus Main Library and the libraries at the autonomous campuses. Final quality control must be maintained at Diliman Campus. Initially, input should be prepared on worksheets. Later on, when staff members have become familiar with the formats and data entry requirements, input may be prepared and submitted via diskettes.

3. Processing - Centralized processing and production will be performed initially at Diliman Campus Main Library. Eventually the standardized procedures will be introduced into the autonomous campus main libraries so that they may perform their own cataloging, indexing, etc., for input to the database.

4. Production and Dissemination - Diliman Main Library will distribute catalog cards, book catalogs, and/or diskettes containing cataloging information to all libraries. Local products, e.g., unit libraries' new acquisitions lists, will be prepared and distributed by the unit libraries.

5. Coding Standardization - Adoption of one of the standard codes for information exchange (ASCII or ISO 2709) will depend upon the software selected. Conversion between ASCII and ISO is feasible and, eventually, conversion programs should be prepared to allow use of external databases. If ISO 2709 is selected, conversion to ASCII will be required if data are to be loaded in and out of programs such as Wordstar.

6. Cataloging Procedures and Format - The library system's current cataloging procedures will be followed, and cataloging input should be done in Machine Readable Cataloging (MARC) formats for bibliographic description, to include books, serials, maps, and audio-visual materials.

A common bibliographic exchange format should be used. It is recommended that the Common Communication Format (CCF) should be adopted. (See CCF: The Common Communication Format, PGI-84/WS/4, edited by Peter Simmons and Alan Hopkinson. General Information Programme and UNISIST, United Nations Educational, Scientific and Cultural Organization, Paris, 1984.) This format encompasses all of the cataloging and indexing fields currently required for the library system. It is less complex than UNIMARC, it conforms to ISO-2709, and it prescribes data elements and tags based on MARC and other universally-acknowledged cataloging formats. It would allow for exchange of data with other library systems. (The library staff have reviewed and approved this recommendation. See letter in Appendix C.)

7. Database Design, Formatting, and Authority File Support - The following must be taken into consideration when designing the database:

- The record format should permit the identification and control of each bibliographic entity in the system and of each copy, each subscription, and each individual item (e.g., volume of a set, issue of a journal, etc.). All these entities and levels of description should be identifiable and retrievable by record and item number from any online or offline search. Each copy of each bibliographic entity or subunit will be identified by a unique item number.

- Each record should have a unique identifier (record number). The record numbers may be assigned by the database management system.

- The database should include dates of significant actions, e.g., date ordered, date received, date cataloged, etc. These may be assigned automatically or manually.

- The system should maintain authority files for bibliographic records and validation tables for both bibliographic and nonbibliographic records. Data should be input, edited and deleted online. The system should validate the following:

  - the presence of specified fields or subfields
  - values of data in specified fields or subfields
  - repeatability of fields.

B. Specific Requirements

The requirements described here represent a system that is fully automated. If less than a fully-automated system is adopted, it would be decided which of the following activities should be automated and which activities should be performed manually.

1. Selection - In addition to the catalogs that are being consulted manually, online bibliographic services should be consulted. These include services such as Books In Print and Ulrich's Guide to Periodicals. Manual use of these tools can provide satisfactory results. However, allowing the computer to scan the files results in more comprehensive yields of candidates for acquisition.

The online services can be accessed via a terminal or microcomputer equipped with a modem, which is connected, usually by regular telephone, to a communications timesharing organization which, in turn, is connected to the database services from the United States or Europe. The services are described in Section VI.

The Asian Development Bank (ADB) and the Thomas Jefferson Library (TJL) are current subscribers to these services. Initially, the library might use the online services via ADB or TJL.

2. Acquisitions - The ideal, fully-automated acquisitions system should include the following capabilities:

- o Preparing purchase orders for vendors, for one bibliographic item or for batches of bibliographic items.
- o Online vendor file.
- o Allowing staff to indicate receipt of material in the system.
- o Automatic encumbering of funds when order is sent, if fund and amount are designated on the order record; funds should be debited when the invoice is approved for payment.
- o Tracking at major funds.
- o Differentiating different types of orders (purchase, exchange, serial, gift, etc.).
- o Protecting security of fund information, order authorization, etc., via passwords.
- o Record format to include all data currently included in manually-generated orders.
- o Access to all fields in the order record.

- o Verification of data for completeness and accuracy eventually to be used as cataloging data.
- o Order forms and order claim forms formatted as required and printed out on demand, singly or in groups according to date, vendor, etc.
- o Automatic claiming mechanism.
- o Posting of payments.
- o Current outstanding order file.
- o Retrieval via all bibliographic access points.
- o Retrieval via order number, purchase order number, invoice number, vendor name or code, etc.
- o Statistics on acquisitions and on vendor performance.

3. Cataloging - The ideal, fully-automated cataloging system should include the following capabilities:

- o Adherence to bibliographic formatting specifications and authority files.
- o Addition of cataloging data to orders records; modification as required.
- o Addition of MARC tagging.
- o Addition of code(s) for cataloging source and owner (campus and unit).
- o Interface with authority files for names, series, and subject fields (including geographic names).
- o Flagging for review of input not passing authority checks.
- o Retrieval via all bibliographic access points.
- o Notification of records failing edit checks, authority checks, or duplicate checks.

4. Indexing. - The ideal, fully-automated indexing system should include the following:

- o Online file of list of journals indexed.
- o Online retrieval of call numbers and bibliographic data for journals received.

- Automatic transfer of journal data (call no., journal title, volume, issue, and date) to avoid redundant keying.
- Online validation of indexing.
- Editing and revising indexing records already in the system.
- Inclusion of data elements currently used for indexing.
- Retrieval via all bibliographic access points.
- Display or printout of all retrieved material in a variety of brief to complete formats.

5. Serials Control - The ideal, fully-automated system should provide the following capabilities for serials control:

- Storage of data elements for each vendor (name, address, code).
- Links to records of all serials received from the vendor.
- Online and printed list of potential claims.
- Printed claims notices.
- Cancellation of claims.
- Access to records via all data elements currently used for manual control, at least author, title, linking entries, call number, ISSN.
- For current issues: publication dates and volume/issue/part/supplement designations, plus actual receipt dates.
- Publication frequency, expected receipt dates, and claiming policy and dates.
- Automatic updating of holdings file when issue is checked in or volume completed.
- Ability to check in issue other than next issue.
- MARC serials tagging.
- Identification of multiple copies (subscriptions) of the same title, with source dta on each (to accommodate receipt of copies from different sources).
- Retention policy, routing, etc.

- Holdings of each title and/or copy, including separate records of each physical piece: bound volumes, microforms, or unbound issues.

6. Circulation Control - The ideal, fully-automated circulation control system should include the following:

- Automated files would record items charged out, discharged, renewed, recalled, and received.
- Two simultaneous charges on the same item should be prevented by the system.
- Delinquent borrower file should be maintained and checked to control further borrowing.
- Automatic overdue notices should be generated at regular intervals to be determined by staff.
- The system should accommodate different loan periods for different collections, locations, borrowers, etc.
- Different classes of borrowers should be included.
- The following statuses could be used:
  - available
  - charged out
  - indefinite loan
  - claimed returned/lost
- System should allow notes to be attached to item records or borrower records.
- Bibliographic records should be accessible by all access points in the catalog.
- Non-bibliographic records should be accessible by item number, borrower name, borrower identification, call number, institution name.
- Circulation status records and borrower records should be password-controlled, limited to authorized staff.

7. Reports and Statistics - The ideal, fully-automated system should produce the following online or offline periodic statistical reports on the number of circulations by:

- material type
- collection
- item number

- individual class numbers and class number groups
- borrower/temporary location type (including binding, photocopying, etc.)
- borrower, sorted by name, affiliation, account number
- borrower type/organization
- terminal/station or password
- type of loan.

Other statistics to be reported periodically by the system should include:

- requests received, number filled by various means (loan, photocopy, interlibrary borrowing); time required to fill, cancelled, etc.
- Interlibrary loan requests received, number filled, time required to fill, cancelled, etc.
- new patrons added
- overdue notices sent
- recall notices sent
- items claimed returned
- stack passes issued
- UP/nonUP users

8. Inventory System - The annual inventory of library holdings, required by law, can be assisted by the automated system. It should be noted that all library holdings will not be contained in the computer files during the first several years of automation, thus disallowing a completely automated inventory of the library's holdings.

For all materials included in the computerized file, the following procedures will provide some savings of time and alleviation of professional staff time that currently is used to perform the inventory.

- Using the computerized files that are comprehensive, e.g., Filipiniana, reserve books, etc., by keying into the computer a list of identifiers (e.g., call numbers or accession numbers) and having the computer compare those numbers with the file for that collection, indicating those records that were not matched with a number).

- Entering into a separate file call numbers and brief identifying information from books on the shelves, to be compared automatically with the catalog file, thus eliminating recently-acquired books from further manual checking.

- For books found to be missing from the shelves, use of the acquisitions/catalog files to determine the price and depreciation of the missing items; earlier-acquired books would require manual checking.

9. Binding - The system should allow recording of titles that are candidates for binding. Ideally, it would provide the following capabilities:

- Automatic generation of lists of titles that are candidates for binding, based on binding frequency, last binding date, last issue receipt, etc.

- Preparation of binding slips.

- Tracking shipment and return; noting volumes held back or problems with returned volumes.

- Accounting and authorization for payments.

- Maintaining binding data and special instructions.

- Similar records kept and reports issued for items to be microfiched.

C. Options for Automation

Two options are described, along with general hardware requirements and current constraints.

1. Option A. Totally Automated, Integrated System - To meet the library system requirements, the optimal configuration is a fully automated, fully integrated system using a minicomputer or mainframe that will support terminals from each of the libraries and from all campuses. It would require microcomputers to be used as terminals from each library or unit library.

The main library and autonomous campus libraries would have two-way communication capability. Each unit library would communicate with its respective main or campus library and with all or selected other unit libraries on its campus.

The libraries would tie into the minicomputer or mainframe system for acquisitions, cataloging, indexing, serials control, retrieval, inventory, and some accounting functions. The libraries would use their microcomputers locally for administrative purposes, e.g., word processing and financial or

statistical accounting. The libraries would be connected via local area networks (LAN) where required, and where feasible.

Currently there are a number of problems and constraints relating to this option. These include

- o Most library automation software for mainframes has not received as much recent attention as software for mini- and microcomputers.

- o Mainframe software can be expensive, e.g., for lease.

- o Mainframe software for library automation requires a large volume of storage capacity, at additional cost and sometimes at the expense of system efficiency for non-library computer users.

- o Some companies that produce mainframes and minicomputers for which library automation is available currently are not established in the Philippines (GEAC/Canada, Digital Equipment Corporation/USA)

- o The only minicomputer for which high-quality library automation software has been developed, that is available in the Philippines, is the Hewlett-Packard HP3000, whose maintenance charges are inordinately high.

- o Telecommunications capability in the Philippines must undergo extensive improvement or replacement before the UP campuses can be linked via telecom.

Within the next several years, this option should become feasible as technology improves in capacity capabilities and price, and if UP installs a telecommunications system linking all campuses.

2. Option B. Partially-Automated Network of Microcomputers - A second or perhaps interim option is to equip all of the libraries with microcomputers, printers, local area networking (LAN) equipment, and appropriate library automation software, as described above.

This option is feasible at a relatively low cost. It would be easily implemented but eventually cumbersome to operate, for the following reasons:

- o The library system eventually will require a larger capacity than that of the current "XT" microcomputers. (See Appendix D for projected file sizes).

- o Microcomputer access to these "filled-to-capacity" disks would be slow.

- o So that all libraries could access others' files, diskettes would have to be prepared to contain subdivided

files. Subdivision would be according to time period, or by special collection or subject discipline. The diskettes would have to be interchanged constantly, resulting in confusion and inconvenience to the librarians.

These constraints eventually might prove to be more cumbersome than the manual system currently used.

D. Software and Hardware Requirements

1. Database Management System Requirements - The database management system should include the following capabilities:

Mandatory:
- o online general systems operation
- o acquisitions
- o reference
- o cataloging
- o serials control

Optional:
- o reserve books file
- o bindery control

These capabilities can be acquired or developed for use on microcomputers, minicomputers, or mainframes. The following criteria should be followed:

- o Does the software's language/operating system/capacity requirement conform to the hardware on which it will be used?
- o How much does the software cost?
- o What experience have others had with it?
- o What organization has responsibility for its creation and maintenance? Will it be maintained? Upgraded?
- o Who supplies it? Will they stay in business?
- o Can the software carry out the required applications in a reasonable amount of time, or be modified to do so?
- o Can any omissions be supplemented by locally-prepared utility programs?
- o Will response time be acceptable?

- Is there a local user support group?

The following are basic requirements that must be met by the software to be acquired (perhaps to be supplemented by locally-prepared programs):

- Data will be entered once and reused in various functions; e.g., acquisitions bibliographic data may be used in cataloging, serials control, etc.

- The system should generate machine-readable output of selected records. Selection criteria will be based on record type, date entered on the system, etc.

- Command-driven, or command- and menu-driven systems are preferable to menu-driven systems for experienced users, since they allow for more efficient use of the system. UP library users will be experienced.

- The system should include online help screens and offline help documentation.

- Paging and scrolling capability should be included.

- All data may be input, changed, or deleted from the keyboard by authorized users, preferably with full formatted screen input and editing. Text editing shall be performed by rekeying incorrect characters.

- The system should flag input of duplicate records.

- Inputs should be processed and rapidly reflected in the database. The system should maintain rapid file updating capability even during periods of heavy system activity for all indexes, files and data elements.

- The system should provide retrieval capability as follows:

  - Display of number of records retrieved by a search

  - Keyword searching of at least

    - author
    - title
    - call number
    - series
    - subject

  - Boolean search capability (AND, OR, NOT).

- The system should be fortified with all possible equipment and data save and backup features to minimize data losses due to power failures and brown-outs.

- o A log should be produced which verifies that backups have been done, reports produced, etc.

- o Each staff member should have a unique identification code and/or password. The system should allow the system administrator to change passwords at any time. Only authorized passwords can initiate the system, take it down, make major revisions, or modify security procedures.

- o The system should maintain consistency as data are incorporated into the database. If a change is made to data in one software program, it should be propagated in other software programs.

- o The system should automatically capture and report statistical data on use of the system, database size, rate of growth, etc.

- o The system should be capable of automatically producing defined reports as requested.

- o Any screen display should be able to be printed on an attached printer. Screen display or printout should be available for any record type in a variety of short to full-information formats.

- o The average response time should be 5 seconds or less. For transactions that take more than 15 seconds, the system should display a message to the user.

- o Search processing should be interrupted easily and should not affect other users.

- o A single function key or simple command should terminate a search.

2. <u>Hardware Requirements</u> - Hardware requirements when fully automated would be as follows:

CPU (4 MB)
Direct Access Storage
1 Line printer rated at 2,000 lines/minute
1 Tape drive
Microcomputer interfaces - should allow for interfacing the mainframe with IBM-compatible microcomputers, for uploading and downloading of data
Telecommunications interfacing to modems between the mainframe and remote or local dial-up terminals. Each interface should operate at data transfer rates from 300 to 1200 baud. The system should have at least four tele communications interfaces, with expansion capabilities to support at least 35 terminals.
67 IBM PC/XT compatible microcomputers (eventually to be equipped with modems (Hayes-compatible)

63 Microcomputer printers
    58 dot matrix printers
    5 letter-quality or near-letter-quality printers
67 Voltage regulators
76 Local area network nodes or modems

The requirements were based on the following estimates:

Library	No. Micro's	No. Reg. Prtrs.	No. LQ Prtrs.	No. Modems/Nodes
Diliman ML & Sci. Lib.	25	10	2	25
Diliman Units	22	22	0	22
Baguio	1	1	0	0
Manila	9	8	1	9
Los Banos	12	10	1	12
Visayas	8	7	1	8
Totals	67	58	5	76

The system should include capability for memory protection and error detection.

Facilities should include at least the minimally required electric power capability, air conditioning/over-temperature protection, dust protection, humidity control, cabling requirements, floor space, storage space, telephones, etc.

IV. RECOMMENDATIONS FOR LIBRARY AUTOMATION SYSTEM

A. Basic Considerations

In determining the hardware and software that would satisfy the requirements set forth in Section III, the following were considered:

- What type and capacity of computer will be required?
- What kinds of equipment are currently available and can be maintained in the Philippines?
- What software packages are compatible with the available hardware?
- What are prices, performance, problems relating to the available hardware and software?
- Which configurations meet the library's requirements satisfactorily?

Further considerations included the following:

- When will an automated system be implemented, i.e., what are the changes in technology that might be realized by the time the hardware and software will be required?
- If microcomputers are used initially, how soon will they be "outgrown"?

Assumptions were made as follows:

- Automation planning and design activities will begin during the next three to six months.
- Library staff will be increased as described in Section V.

B. Recommended Approach

The highest priority for library automation is for computer assistance in producing manually-used products, e.g., the card catalog, published index, and reader's lists. It would take one or two years before the automated files would grow to the extent required for automated retrieval.

1. Beginning with Microcomputers - The recommendation is to begin with the system described as Option B (Section III) and phase into the system described as Option A. The library can design the database, data entry and report formats, etc., using a software package for microcomputers. The software package should meet most of the requirements specified in Section III. The

software's capability can be augmented with other utility software, to provide capabilities that might not be included in the selected package.

Data entry can begin on microcomputers and continue until the cataloging file (the largest file) exceeds 20 megabytes (MB) (current hard disk capacity; this is expected to expand in the near future). Appendix D shows projections of database volume.

2. Database Volume Projections - The following are estimates for the growth rate of the catalog file, at the time new acquisitions from the grant are on hand to process, and input to the automated system has begun:

Time Period	Annual	Grant	Backlog	Cum. Total	No. Disks
Year 1	15,084	9,612	3,150	27,864	0.63
Year 2	15,084	9,612	3,150	55,728	1.26
Year 3	15,084	9,612	3,150	83,592	1.89

This shows that, during Year 2 of processing, the catalog file will exceed the 20MB disk.

3. File Partitioning and Distribution - At the time microcomputer hard disks' capacities are filled it will be necessary to subdivide, or partition, the subfiles, perhaps by date, into several disks, and manipulate multiple disks during retrieval. Production of catalog cards, etc., should not be greatly affected by partitioning, since these products will come from the most recently-processed disks.

However the file will contain enough records to make it worthwhile to search via the computer. Searching from multiple disks will prove to be inconvenient.

4. Phasing Into Larger Capacity Hardware - At that time it will be necessary to introduce a mainframe (or high-capacity micro equipment) to assist with the processing of the larger files and to allow retrieval access to the entire file at once rather than to many subfiles. The microcomputers will connect with the mainframe to "upload" newly-processed information. The mainframe will "download" data to the microcomputers for revision and other localized use. Also, the microcomputers can be used as terminals, connecting with the mainframe for interactive online searching.

5. Telecommunications - The approach described above presents a problem in serving the campuses other than Diliman. If telecommunications were available for remote access to and from those campuses, the mainframe at Diliman could provide online service to all campuses. Without telecommunications, the autonomous libraries will have to contend with partitioned files on multiple disks for access to the entire library system's collection. Alternatively, they can use (at Los Banos) or install mainframes or supermicro's.

Local area networks (LAN) should be established at the earliest opportunity. Libraries that are located on the same campus, whose distances apart exceed LAN limits, should be furnished with modems (installed on their microcomputers) for local communications.

The use of radiophones for data transmission should be investigated and implemented where feasible. Radiophones currently are used between Diliman and Manila campuses and between Diliman and Los Banos campuses.

6, Future Considerations - For the first two years partitioned files may not present a problem since all campuses do not require frequent access to all other campuses' files. The autonomous campuses' own files should be accommodated by a 20 MB disk for the 1980's, except for UP/Manila's indexing file, which would exceed one 20MB disk, probably during the tenth year.

By the time the storage media are outgrown, technology should have expanded its capability for handling large capacities in a manner that provides rapidly accessible, inexpensive, high-density storage.

Two fairly new developments may be readily available when the need arises.

- "Supermicrocomputers" that accommodate storage capacities of up to 80 MB currently are available. It is likely that they will continue to be improved. A supermicro could be placed at each campus.

- Optical disk technology, currently known as CD/ROM, should be introduced into the library system as soon as local production is available at a reasonable price. Further description of optical disk technology is included in Section VI.

Exhibit 2 shows the hardware and software that were considered, their prices, and comments on their advantages or disadvantages.

C. Recommended Hardware and Software

1. Recommended Hardware - IBM mainframes and IBM compatible microcomputers are readily available in the Philippines. UP is considering acquisition of an IBM 4341 mainframe. Therefore, the recommendation for additional hardware is as follows:

- IBM PC/XT compatibles - to serve as local processing units and terminals for uploading/downloading.

EXHIBIT 2

COMPARISON OF SOFTWARE AND HARDWARE

SOFTWARE	HARDWARE	SOFTWARE COSTS	HARDWARE COSTS*	OTHER COSTS*	COMMENTS
MAINFRAMES:					
CDS/ISIS (ver. 4.0)	IBM mainframe and terminals	Free from UNESCO	Available at computer center	-	Requires large capacity & CICS to operate; supports terminals on line; user-friendly
DOBIS/LIBIS	IBM mainframe and terminals	₱15,000/ month maintenance	Available at computer center	-	Requires large capacity & CICS to operate; supports terminals on line; includes sub-systems for library operation; user-friendly
STAIRS	IBM mainframe and terminals	₱20,000/ month maintenance	Available at computer center	-	Extremely slow, requires large capacity & CICS to operate; supports terminals online; user-friendly
MINICOMPUTERS:					
MINISIS	HP300 series and terminals	May be free from IDRC; may cost ₱30,000/yr.	₱2M - 3M	₱20,000/ month maintenance	Easy to use, difficult to install & update; strong local user group; undesirable maintenance service & related costs; user-friendly
CDS/ISIS	DEC mini & terminals	Free from UNESCO	₱2M - 3M, perhaps donated	Unknown	DEC currently not located in Philippines but may donate computers to Philippine government; user-friendly
INMAGIC	DEC mini & terminals	Approximately ₱80,000 for each copy	₱2M - 3M, perhaps donated	Unknown	DEC currently not located in Philippines but may donate computers to Philippine government; includes subsystems for library operations; user-friendly
MICROCOMPUTERS:					
CDS/ISIS	IBM PC/XT compatible microcomputers	Free from UNESCO	-	-	Capacity will be exceeded in 2 years; strong local user group anticipated; user-friendly
Datalog/Datatrek	IBM PC/XT compatible microcomputers	₱50,000 for each of 4 modules	-	-	Capacity will be exceeded in 2 years; software is inflexible, limited in capability, user-friendly
INMAGIC	IBM PC/XT compatible microcomputers	Under ₱100,000 for multiple copies	-	-	Capacity will be exceeded in 2 years; includes subsystems for library operation; user-friendly; no local user group
Micro-DIS	IBM PC/XT compatible microcomputers	Free from USAID	-	-	Capacity will be exceeded in 2 years; meant for small libraries; user-friendly; no local user group
Superdoc, SCI-MATE, etc.	IBM PC/XT compatible microcomputers	Various prices, ₱10,000 up	-	-	Capacity will be exceeded in 2 years; user-friendly; must be purchased; no advantages to warrant further consideration

*In addition to costs for microcomputers and their maintenance included in Section VIII.

- IBM 4341 mainframe - for processing files when microcomputer storage media have been exceeded; to input from microcomputers, process it, and download the processed files to microcomputer storage for local use.

2. Recommended Software - The recommended software is

- CDS/ISIS (mini-micro version 1.0)
- CDS/ISIS (mainframe version 4.5 or most recent version)
- Other software including the following (or comparable) packages:
  - Wordstar
  - Lotus 1-2-3
  - dBASE III

The database management software was selected because it can fulfill the library's requirements as well as any other available software, and it is free from UNESCO and already available at UP. The micro version of this system is being adopted by many organizations throughout the world. Evaluations of its performance are favorable. At least one other organization in Manila, the International Center for Living Aquatic Resources Management (ICLARM) has acquired the software and soon will implement it. The UP Institute of Library Science (ILS) has been using and evaluating the software. ILS also owns an earlier version of CDS/ISIS for the mainframe. They have sponsored demonstrations of its use.

The only known disadvantage of CDS/ISIS is that it is "menu-driven", that is, the user cannot issue a command directly, but must select commands from a menu that appears on the screen after every transaction. This feature is helpful to the unfamiliar user, but wastes a few seconds of the seasoned user's time, and eventually becomes annoying. Several users or potential users of CDS/ISIS have commented on the annoyance of this feature. Since the system is being upgraded regularly, it is likely that attention will be given to user complaints and eventually the user will be able to choose between "menu-driven" and "command-driven" modes.

The primary difference between CDS/ISIS and INMAGIC or DOBIS/LIBIS is that CDS/ISIS currently does not have already-prepared library subsystems. Each user must tailor the system to meet its own needs. This can be regarded as a disadvantage if the user organization has no staff available to develop the subsystems. It can be regarded as an advantage in allowing the user to tailor it to meet its specific needs. It is expected that CDS/ISIS users throughout the world will develop a wide variety of special applications and share them with other users.

If CD/ROM is implemented, the mainframe would be required only for processing uploaded data from the microcomputers and preparing the data for optical disk production.

D. Hardware/Software Phasing

The following projections can be made for introduction of the hardware and software into the library system:

1. Near Term (3 months - 24 months), while databases and system outputs are being designed and developed)

- o IBM PC/XT compatibles

2. Medium Term (after 24 months), when files have exceeded microcomputer capacity)

- o All equipment named above
- o IBM 4341 mainframe and peripherals for uploading (IBM 370 also could be used)
- o CDS/ISIS (mainframe version 4.0)

3. Long Term (as soon as improved technology is available at a reasonable price)

- o All of equipment named above
- o Production of databases on CD/ROM, probably via contractor
- o CD/ROM players interfaced with microcomputers

4. Future Options

- o Replacement of some PC/XT's with supermicro's; possible replacement of mainframe(s) with supermicro's.
- o Use of telecommunications systems, e.g., possibly to be furnished by NEC; high-quality voice grade telephone service between all campuses would be preferable.

E. Alternate Approaches

1. Alternate Approach No. 1 - The MINISIS system which operates on the Hewlett-Packard HP-3000 minicomputer is readily available and will satisfy all of the library's system requirements. It can serve as the "mainframe". It can be interfaced with the IBM PC/XT microcomputers.

This approach is recommended only if the IBM mainframe is not acquired, or if the university's mainframe is not readily available to the library.

Advantages of this system are:

- o IDRC/Canada usually furnishes the software free of charge to developing countries.
- o There are several Philippine organizations using the system. These organizations might provide assistance to the library in putting up and operating the system.

The primary disadvantages according to local users are as follows:

- o A Hewlett-Packard computer would have to be purchased.
- o The system is difficult to load, update and maintain unless computer staff are familiar with Hewlett-Packard's SPL programming language.
- o Print formats are not refined, and system output is not aesthetically pleasing.
- o Hewlett-Packard's Philippine agents charge an exorbitant amount for maintenance (P27,000/month, compared with similar charges in Malaysia amounting to the equivalent of P8,333/month.) In addition to the high cost, service is said to be unsatisfactory.

2. Alternate Approach No. 2 - CDS/ISIS is being programmed for use on the Digital Equipment Corporation's DEC minicomputers. DEC currently does not serve the Philippines. However, DEC is one of the companies committed to providing assistance to the electoral commission here. This may mean that DEC will be establishing maintenance facilities in the Philippines. If so, this option should be considered if problems are encountered with the first two options. Maintenance arrangements and costs cannot be estimated at this time.

F. Dynamic Aspects of Automation

The claims of a Digital Equipment Corporation advertisement are borne out with nearly every computer installation: "A FACT OF LIFE: If you are buying a computer today, it is near-certain that you'll be buying others in the future. The technology is still moving. And every advance brings lower costs, higher performance and new applications."

Hardware and software must be evaluated regularly for their performance, efficiency, and economics relative to available new technologies.

The hardware and software acquired for the library system should be considered one step toward automation. It is unlikely that it could be a final transaction.

G. Schedule for Automation

Regardless of the approach chosen, library automation can begin immediately via the microcomputer currently in the library and the microcomputer version of CDS/ISIS. Microcomputers should be acquired immediately. This will allow library staff at all levels to become familiar with computers and become expert by the time the library system is implemented. Until then, the microcomputers can be used for word processing, accounting, etc.

The estimated schedule for automation is as follows:

YEAR 1

First Six Months

Acquisition of hardware
Acquisition of software
Familiarization with hardware and software
Software tailoring
Development of report formats
Development of input formats and forms
Testing of input formats, report formats
Modifications, as required

Second Six Months

Preparation of procedures manuals
Preparation of training materials
Staff training
Initial input
Testing of system output
Modifications, as required

YEAR 2

System operation
Ongoing training programs
Preparation of output
- order forms, bindery forms, etc.
- catalog cards
- indexes
- statistical reports

YEAR 3

Continuing operation
Use of system output for inventory

During the second year, the system should be evaluated with respect to its rate of development, the database design and its products, and the possibility of applying new technology.

By the end of the third year, the system should be completely operational. However, backlogs and backfiles may still be in process.

H. Priorities for Automation

The various components of the system should be implemented in the following sequence:

- o Acquisitions, Cataloging, and Indexing - first priority; building the bibliographic databases starting with the ordering system will result in the most efficient use of the data, avoiding duplication of input to the greatest possible extent. They can be implemented simultaneously since input and report formats will be the same, or closely similar. Work is performed by separate staff in different parts of the library, supervised by different persons. Starting these components simultaneously will also allow more persons to be trained at once.

  Schedule: These components should be designed and implemented during the first six months.

- o Circulation control - second priority. Less impact on all library operations. Automation would have more impact and be more useful if the entire collection were included in the catalog database.

  Schedule This component should be designed and implemented during the 7th through 12th months.

- o Serials control, Bindery control, reserve book catalog, and other special collections' retrospective catalogs - third priority.

  Schedule: This component should be designed and implemented during the 13th through 18th months.

I. Selection of Materials for Processing

Processing and housing library materials is costly. They are even more costly in an "automated" situation, since a higher volume of stored information require valuable computer storage space and adds time to all processing operations.

Materials should be prioritized for processing according to their relative worth to the library's clientele. Materials of marginal value should be weeded from the in-process collection.

It is recommended that processing into the automated files should be done in the following sequence:

1. Newly-purchased acquisitions (via library fund or grant)
2. Selected materials from backlog
3. New gifts, exchanges, etc.
4. Early 1980 material that are in the union catalog
5. Low-priority materials from backlog.

J. Backlog Processing

The backlog of approximately 20,000 volumes at the Main Library should be examined for its current worth before it is processed. It should be evaluated to remove, or delay processing for, any material that is not superior to current and new holdings. Library staff estimate that at least 7,500 items from the backlog will be processed.

V. PROJECTED IMPACT ON MANPOWER AND STAFFING

A. Projected Manpower Savings

Operations and related statistics from the Main Library, Diliman Campus were examined in detail to determine the amount and type of staff time currently being spent on manual library activities. From flow diagrams of current procedures, major activities that could be assisted and the steps that could be eliminated by an operational automated system were identified. Related labor reductions were estimated; these estimates were conservative. Statistics for manual procedures were assembled by library staff. The results of analyzing these operations and statistics are shown in Exhibit 3.

This comparison shows that, over a year's time, a savings of 7.2 persons' time should be realized as a result of automation at Diliman Campus Main Library. The savings will involve primarily clerical tasks. This will represent a savings of 45% of support staff time at the Main Library.

The procedures manual is followed by all libraries at all campuses, and a high degree of consistency is maintained among the campuses. Skill levels are comparable, according to the "professional" and "support staff" categories designated for library staff. Production rates are closely similar. Therefore, it can be assumed that similar savings of staff time will be realized throughout the system if automated procedures were implemented, university-wide.

Although the tasks identified for time reduction are primarily clerical, professional staff time will be saved. It is estimated that at least 50% of professional staff time currently is spent performing clerical tasks, e.g., checking for accuracy and consistency of clerical work that can be assisted by computer processing. This could be reduced to approximately 10%.

The estimated saving of clerical and professional time resulting from automation is as follows:

	Current	% Savings	No. Saved
Librarians	93	40	37
Support Staff	243	45	109

Additional savings would be realized through automation of serials control, bindery records control, use of word processing capabilities for administrative purposes, use of spreadsheets for accounting, etc. These were not measured. It is estimated that manpower for those activities might be reduced by 30%.

These savings could be realized only when the system is operational. Until then, learning the system, modifying formats, etc., are likely to offset any gains from use of computers.

Exhibit 3

ANTICIPATED WORKLOAD/MANPOWER REDUCTION

		Manual	Automated
1.	Acquisitions		
1.1	Book orders and subscriptions	65 titles/day	65 titles/day
1.2	Gifts and exchanges		
	- letter requests	3/hour	12/hour
	- offices visited	3/day	3/day
	- acknowledgement letters	3/hour	12/hour
1.3	Receiving/posting/recording	60/day	120/day
1.4	Bookkeeping/processing pmts.	80/day	160/day
1.5	Accessioning and stamping	35/day	25/day
1.6	Annual volume of work		
	- titles req. for ordering	60,000/yr	60,000/yr
	- persons required	3.84	2.56*
	- volumes rec`d & acc`d	18,280/yr	18,280/yr
	- persons required	3.43	2.25
2.	Cataloging		
2.1	Cataloging	8 titles/day	8 titles/day
2.2	Revision	25 titles/day	25 titles/day
2.3	Card production (days)		
	- typing	25.625	25.625
	- proofing	3.713	3.713
	- correction	6.74	6.74
	- set cards	15.375	0
	- print cards	15.375	5.0
	- type headings	117.82	0
	- stamp cards	19.12	0
	- stamp revision	33.72	0
	- recording	5.69	5.69
	Total days	276.895	46.718
2.4	Annual volume of work	8,200 titls/yr	8,200 titls/yr
	- persons required/cataloging	4.27	4.27
	- persons required/revision	1.37	1.37
	- persons required/clerical	3.5	1
3.	Indexing		
3.1	Indexing	32 art./day	32 art./day
3.2	Revision	48 art./day	48 art./day
3.3	Encoding	160 ent./day	160 ent./day
3.4	Annual volume of work	8,890 art./yr	8,890 art./yr
	- persons required/indexing	1.16	1.16
	- persons required/revision	0.77	0.77
	- persons required/clerical	0.23	0.23

Exhibit 3 - continued

3.5	Indexing - Production of IPP Semi-Annual Printed Issue		
3.5.1	Type & proofread process slips of index entries	2 hrs/page	2 hrs/page
3.5.2	Sort and alphabetize P-slips by author/subject	45 min/page	0
3.5.3	Revise author/subject files	15 min/page	0
3.5.4	Layout index entries	30 min/page	0
3.5.5	Type first draft	2.5 hrs/page	0
3.5.6	Proofread draft	30 min/page	5 min/page
3.5.7	Type corrections in draft	24 min/page	5 min/page
3.5.8	Proofread corrected draft	3 min/page	0.5 min/page
3.5.9	Type corrections in final drft	24 min/page	5 min/page
3.5.10	Proofread final draft	3 min/page	0.5 min/page
3.5.11	Make final corrections in master copy	45 min/page	5 min/page
3.5.12	Photocopy master copy	1.5 min/page	1.5 min/page
3.5.13	Type title headings/page numbers	2 min/page	0
3.5.14	Clean copy for stencilling	6 min/page	6 min/page
3.5.15	Produce master stencils	4.5 min/page	4.5 min/page
3.5.16	Print IPP	8 min/page	8 min/page
3.5.17	Collate printed pages, etc.	12 min/page	12 min/page
3.5.18	Bind printed volumes	3 hrs/vol	3 hrs/vol
	Total (rounded off)	12 hrs/page	6 hrs/page
		492 days/ issue	246 days/ issue
	@ 2 issues/year	4 persons	2 persons

5.	Reader Services		
5.1	Inventory/Main Library (days)		
	- Checking shelves, etc.	44.00	44.00
	- Searching/volumes	3.64	1.82
	- Searching/cost, etc.	3.64	1.82
	- Typing	1.82	0.91
	- Editing/proofreading	0.73	0.73
	- Report writing	2.00	0.50
5.2	Overdue notices	10.00	1.00
5.3	Reserve Section		
	- Updating reserve book list	15.76	5.00
	- Inventory	3.81	3.00
5.4	Inventory/Science & Serials Section		
	- Checking shelves, etc.	58.6	50.0
	- Searching	7.29	3.65
	- Typing	3.63	1.82
	- Editing/proofreading	0.73	0.73
	- Report writing	2.00	0.50
5.5	Inventory/Filipiniana Section		
	- Checking shelves, etc.	14.58	12.00
	- Searching/volumes	3.64	1.82
	- Searching/cost, etc.	3.64	1.82

Exhibit 3 - continued

- Typing	1.82	0.91
- Editing/proofreading	0.73	0.73
- Report writing	2.00	0.50
Total days	183.65	129.24
- total staff required	0.76	0.54

Summary

Activity	Staff Equivalents (per year) Manual	Automated	Reduction
Acquisitions	7.27	4.81	2.46
Cataloging	3.50	1.00	2.50
Indexing	0.23	0.23	0
Index production	4.00	2.00	2.00
Reader services	0.76	0.54	0.22
Totals	15.76	8.58	7.18

Staff time saved by automation should be allocated to the following tasks that currently await additional staff time:

- o Cataloging backlog
- o Indexing of special collections
- o Reference work
- o Preparation of specialized user products.

B. Interim Staff Requirements for System Design and Implementation

Staffing the automation project will require diversion of current staff time in addition to acquiring new staff members. For the first one to two years, automation staff as well as senior library staff time will be required to participate in automation activities. This will ensure that their respective section's interests are served in the design of the database and system output. It will also ensure the proper training and supervision of their support staff. Library staff will be required to do the following:

- o Become familiar with hardware.
- o Become familiar with database management software.
- o Assist with tailoring database management software to meet library's specific requirements.
- o Assist with definition of requirements for additional utility programs.
- o Write or tailor system documentation and procedures manuals.
- o Prepare database format specifications and data element definition.
- o Design and prepare input sheets and instructions.
- o Design and prepare report formats and instructions for executing their use.
- o Prepare and input machine-readable authority lists.
- o Prepare training materials and courses.
- o Train personnel in data preparation, data entry, and system use.
- o Revise the above, based on use of the system and staff feedback.

Sufficient staff time must be allocated for numerous administrative and supervisory activities that will be required for automation.

Staffing requirements for the first 18-24 months are estimated as follows, based on the current rate of acquisitions and processing:

1. Library

   Full-time manager of automation activities (new position)

   Full-time assistant to the manager (new position)

   25% of all senior library staff to be detailed to the automation project; another 10-20% of their time might be required in supervising their staff, solving equipment problems, etc.)

   Other librarians and support staff, unchanged.

2. Computer Center

   25% of a senior staff member to serve as library liaison

   Programming assistance, e.g., from senior students at no cost

C. Staffing Requirements for Additional Workload

The library is acquiring approximately 22,000 volumes via a grant, in addition to their usual acquisitions. In addition, they plan to process their current backlogs. This will require additional librarians and support staff. The overall projections for processing and related manpower requirements were estimated based on the added volume of acquisitions as shown in Appendix D. Estimated percentages of additional staff are as follows:

Type Staff	% Additional Staff
Acquisitions	39
Cataloging	46
Indexing	24
Serials Control	24

Some new staff should be phased in immediately, to allow for training before the impact of the grant acquisitions is felt. Other staff should be acquired to coincide with requirements for processing the added workload into the automated system, i.e., in 6-12 months.

D. A More Active Role for the Library

When the automated files have reached a volume of 3,000-5,000 records, byproducts should be prepared. The files should contain sufficient items to produce special bibliographies, perform searches, and provide variations, e.g., current awareness service for specific university programs, faculty members, etc. By that time the system should be operational and the library staff will be devoting less of their time to the automation activities. They will have time to design and produce new user services.

The new services should be designed and prepared with the following objectives in mind:

- o to serve university priorities such as new areas of emphasis in curricula;
- o to respond to student and faculty requests and suggestions;
- o to make available (perhaps publish and sell) bibliographies of some of the university's unique collections, e.g.,
  - Filipiniana collection
  - Vernacular collection
- o to interest a clientele beyond the university, to whom various products and services might be sold or offered for exchange.

In addition to the new services that are byproducts of the database, the following should be introduced:

- o Newsletter for library staff;
- o Library-related newsletters, calendars of events, etc. for students and faculty;
- o Library users' education programs, e.g. on the new products and services;
- o Sponsorship of library-related computer literacy programs for staff and users.

Faculty and student representatives should be assembled into a library services committee to assist with suggestions for, and critique of the new products.

Eventually, the use of commercially-available online services would be introduced throughout the library system. These services could also be used to broaden library products to

include references from those databases. The online services might be purchased with funds from the sale of library products.

New activities were not included in staffing estimates or costs. Presumably the staff that had been acquired for the additional workload would have completed that work by the time the automated system is operational. They could be assigned to the new activities.

E. Training and System Support

1. Current Status of Library Staff Training - A few library staff members have training and experience in the use of automated systems. For example, one of the Diliman Main Library staff members has completed a graduate degree in management information systems. He is well-versed in computer programming and operations, and in library applications. He has developed some database management systems using dBASE III. Over the past year he has given some introductory instruction in the use of microcomputers to Main Library senior staff.

Most staff members throughout the library system had little or no experience with computers. During this project, basic training was begun to familiarize library staff with the use of microcomputers and the types of application that are available for use in libraries. The training was designed and conducted by Computer Center staff, using the training room at the Computer Center.

Librarians were asked to fill out a questionnaire furnished by the Computer Center to determine their skill levels. Persons were then invited to attend training sessions in groups according to their skill level. Two half-day sessions covered the basics of microcomputer use and the Disk Operating System (DOS). At the end of these sessions, an examination was given to evaluate the improvement in skill level, and to show the trainees their progress in learing to use microcomputers.

A third half-day session demonstrated the capabilities of a database management system of the type to be used for the library system. The system demonstrated was the microcomputer version of CDS/ISIS. The demonstration, which included data entry and retrieval from a sample file, was conducted by Institute of Library Science staff.

More than thirty librarians from Diliman and other campuses attended these sessions.

2. Procedures Manuals and Training Materials - Procedures manuals should be prepared to supplement software manuals. The following should be described:

- Location of hardware.
- Authorized personnel, and various levels of access.
- Login procedures.
- Database definitions.
- Step-by-step procedures for each operation with a full range of examples for each data entry and system output feature. A "cookbook"!
- Coding schemes and how to apply them.

In addition, exercises should be prepared for each of the transactions to be taught.

The procedures manuals and training materials should be prepared in enough depth and detail to allow new employees to be trained with a minimum of instructor assistance.

3. Future Training - The training series should continue on a regular basis, preferably bimonthly or quarterly. Until library software is selected and acquired, the following courses could be given:

- Wordstar (or comparable word processing software) - basic, intermediate, and advanced.
- Lotus 1-2-3 (or comparable software) - basic, intermediate, and advanced.
- dBASE III

As soon as the library software is acquired and installed, training should be given to all library staff who will use the system.

- All staff should receive an overview course on the automated system and how it relates to the current manual system.
- Senior library staff should be trained to ensure a working knowledge of all system modules.
- Intermediate library and clerical staff should be trained to perform their respective functions.

Assuming that library personnel have completed the basic training sessions, the library-software-specific training should be geared to the selected system. Every trainee should have at least four hours of "hands on" training.

Training should include instruction in the system's file structure as well as the details of each software package used.

4. Ongoing Professional Development - Library staff should upgrade their computer skills and awareness of relevant new technological developments on a continuing basis. Representatives from the staff should attend

- o Relevant university-level courses;
- o Participate in exchange programs with institutions offering information science curricula;
- o Workshops and institutes on
  - library automation
  - database development;
- o Exhibits at conferences;
- o Vendors' presentations;
- o Visits locally and abroad to visit operational systems.

In addition, they should

- o read computer and library automation journals and newsletters, and
- o discuss new applications with computer center staff on a regular basis.

VI. EXTERNAL SERVICES AND NEW TECHNOLOGIES

A. Online Database Services

There are several hundreds of databases available via online retrieval services in the United States and Europe. These services are available via telecommunications systems in the Philippines. They are currently being used by organizations in Manila including the Asian Development Bank and the Thomas Jefferson Library.

The services allow searching the files of indexing and abstracting services such as Medline, Chemical Abstracts, Biological Abstracts, Psychological Abstracts, Sociological Abstracts, etc. These databases can be searched by entering subjects, authors, title words, etc., into the computer via a terminal. An instant response is printed out from the computer, indicating the number of bibliographic citations matching the search query. The user may type in a request for the full citations to be displayed at the terminal or to be printed out at the computer facility and mailed to the user.

1. Costs - Many of the services do not require a subscription charge or a startup charge. They charge the user only when the service is used.

Typical charges are as follows:

Connect charge:	$12-300/hour depending upon database used
Telephone access charge:	$0.20/minute (min. $3) $0.60/kilocharacter
Charges for viewing or printing retrieved items:	$0.25-0.35/item for most databases

Appendix E shows the databases available from the DIALOG service and their prices.

An experienced searcher can develop a search strategy before going online. The actual online time for a search that includes several combinations of subject descriptors and allows the user to review and tailor the search results several times can be 10-15 minutes. It can also require as little as 3-5 minutes or several hours to perform a search. The number of citations to be chosen for viewing or printing varies. However, an example of costs for a 10-minute search at $35/hour that yields 50 items to be viewed or printed might be charged as follows:

Connect charge	$ 5.83
Telephone access charges	6.00
Charges for viewing or printing	12.50
Total charges for search	$24.83

The cost-effectiveness of the search must be determined in comparison with available personnel or one's own time to perform the search manually. Also, manual searching tools usually provide fewer subjects to be searched. The computer can scan the entire text of each record, with the possibility of locating more items. However, it can be argued that a human can make quality or relevance judgments during manual searching while a computer has to rely upon the accuracy of the indexing of the database and the relevance of the search query entered by the user.

2. Cautions - Setting aside the cost-effectiveness of performing the searches, there are several factors to be considered if these services are to be used in non-U.S. or European countries. They include the following:

- Unless the source materials are readily available, the search results may not be useful, especially if the source documents are required immediately to be of value to the user.

- It may be very costly or require lots of time, followup, etc., for the source documents to be acquired.

- Telephone service must be of high quality to access the online services; otherwise, disconnects and line noise may result in lost or inaccurate data, higher charges, and annoyance to the user.

- Foreign exchange is required for payment of the services.

In countries where the above problems are prevalent, users may become dissatisfied and annoyed with the services rather than appreciate the results.

3. Trends - In many highly industrialized locations, where industrial research and development has high priority and can afford to pay the high cost for instant information, the financial, chemical, and engineering databases receive the most frequent use. In less industrialized locations, the database most frequently used is Medline. While other disciplines can afford to obtain new information more slowly, the medical profession seems to have a greater sense of urgency about receiving the newest information. Perhaps medical professionals may be better able to pay for the online services.

Another important factor is that medical libraries worldwide are conveniently organized into regions, where source materials may be less distant from the user.

4. Use of Online Services at UP

The library system should consider the use of these services, on a trial basis as soon as they are equipped with microcomputers with modems and high-quality voice-grade telephone lines in the libraries. (The current telephone service in the Main Library, would not support the use of the online service.)

In order to use the services, the library would establish an account with the vendors, obtain a user ID from each vendor, and dial up to the local telecommunications node via regular telephones connected to the terminals. Microcomputers with modems would serve as the terminals.

The following would be required:

a. Paying for the Service - An initial budget should be allocated for payment of searches and related document delivery service. Free service should be extended to students and faculty for six months to one year. Non-student users should be limited to free service, e.g., perhaps to two free searches. Then they should be required to pay for the service.

Professionals should be encouraged to develop a budget for searching. As they realize the benefits (or frustrations) of the service, they will determine whether or not it is worth continuing on a "paid" basis.

b. Getting Familiar with "Online" - The library should subscribe to more than one service that provides Medline and other bioscience services and compare costs and ease of use of the services. For example, the Dialog service is more popular and better-known, but the BRS service provides excellent coverage of medically-related databases and it is less expensive than Dialog. BRS has an "after dark" (i.e., in the United States) rate that is about 50% lower than the costs during normal business hours. That time period here would be during business hours.

Special arrangements for the most rapid document delivery service at the lowest costs should be negotiated, e.g., with a worldwide delivery service such as DHL, or with Philippine Airlines. These services should be used on a trial basis.

Several organizations in foreign countries use U.S.-based information brokers for document delivery service and, in some cases, to perform the online searches. These should be investigated and used on a trial basis.

c. Pilot Project at Manila Campus - UP's information requirements match those of the the "less industrialized" locations. Therefore, it is recommended that the Manila Campus should lead off with trial use of the services, to serve the medical faculty and students. They might also sell the service to the country's medical community.

Activities required to implement the service would include the following:

- o Request forms, instructions, interview guidelines, etc. would be developed.
- o The searcher would be trained in the use of the databases.
- o Search requestors would be interviewed and their searches performed.
- o Documents would be ordered as requested and furnished to the requestor.
- o Costs would be assessed and, when required, an invoice would be prepared and forwarded to the recipient of the search results.
- o Recipient's satisfaction with search results would be determined; feedback would be used as appropriate.

Developing and implementing the trial service will require considerable time, especially if it is to be evaluated to determine its relative value to the library system, e.g., whether it should continue at the Manila Campus and whether it should be introduced at other campuses in their respective subject disciplines. It might require as much as one-half to one-fourth of a professional person's time for a year.

One possible solution is to allow one or two senior(s) or graduate student(s), e.g., from the Institute of Library Science, to do this project as a practicum for an advanced course.

A consultant might be provided through a donor agency. For example, USAID is funding a project that supports field activities relating to vector control information. The Institute of Public Health's publication program in filiariasis, parasitology, and nematodes might provide justification for assistance in designing and setting up online retrieval service, to expand the current coverage of those diseases in the Philippines, e.g., to include comparisons with studies in other parts of the world.

The service could begin as soon as the medical library acquires a microcomputer with a modem, establishes an account with an online service vendor, and secures funding for the service.

4. Phasing Online Service Into Other Libraries - The second library to use online services should be the science library at Diliman. Other unit libraries should become online subscribers according to the requests of their users. They might determine users' interest in online service via a brief questionnaire that would indicate the types and frequency of online service required, and their users' willingness to pay for the service.

It is recommended that free or subsidized services should be provided initially.

Online service is least important to the arts and humanities. Since the main library at Diliman serves those groups, and a large amount of Main Library staff time will be devoted to basic automation activities, it is recommended that the main library should introduce online services much later, e.g., in two to three years.

5. Related Activities - In support of online retrieval service, a comprehensive union catalog and list of serials must be made available as soon as possible. A UP union catalog and list of serials will be one of the byproducts of the automated system. It should be supplemented to include all Philippine holdings as soon as possible.

B. Optical Disk Technology

Library systems require large files of text. This requirement usually limits choices in the types of hardware and software to be used. Eventually a sizeable library collection will dictate the use of a mainframe (maxi- or minicomputer) to be able to process rapidly the entire file at once. Microcomputer use becomes cumbersome when the capacity exceeds the 20 MB hard disk.

A relatively recently-developed technology that is becoming more popular for large databases is optical disk storage, currently called CD/ROM (Compact Disk/Read Only Memory). The optical disk is 12 inches wide. Storage capacity is claimed to be 600 million to one billion bytes per disk. Six hundred million bytes would be equivalent to 20,000 full-length pages of printed text, or several hundred books. Therefore, one disk would accommodate files representing several years' acquisitions. Perhaps the library system's entire catalog could be stored on two disks.

1. Advantages - In addition to its extremely high-density storage capacity, optical disk technology has the following advantages:

- Where several organizations in distant locations need access to a large file, it can be provided to each organization on an optical disk, thus replacing the requirement to be connected to a central processor via telecommunications.

- Optical disks can be accessed via a special player connected to an ordinary microcomputer.

- The player and its microcomputer interface equipment costs about $500, and the cost continues to be reduced.

- Once created, the disks can be duplicated easily and inexpensively, at present for about $10 per copy.

- The optical videodisk allows text and other visual information, e.g., illustrations, to be recorded (a feature that may not be directly applicable to library needs).

- Full text of documents can be stored and accessed rapidly. (Storage of printed material can be assisted by optical scanning technology.)

2. Disadvantages - The disadvantages include the following:

- To date, there are relatively few organizations that produce the disks (locations include the United States, the United Kingdom, and Switzerland). None has been identified in SE Asia.

- The disks are expensive to produce, initially; the current cost is about $4,000.

- The disks cannot be updated and rewritten unless they are newly produced for each revision. (Improvements are said to be under development.)

3. Availability to Philippine-Based Organizations - While the disks cannot be produced in the Philippines at present, at least two libraries here will begin using optical disk systems during the next few months. The International Rice Research Institute (IRRI) in Los Banos will be using CAB (Commonwealth Agricultural Bureaux) Abstracts on CD/ROM produced in the U.K., and the International Center for Living Aquatic Resources Management (ICLARM) will be using FAO's ASFA (Aquatic Sciences and Fisheries Abstracts) on CD/ROM produced by a contractor in the U.S.

Players are made by Philips (Netherlands), Hitachi, and Sony. ICLARM has selected a Philips player. The Philips players can be serviced here. (Possibly the other two companies will support their equipment here, as well. This was not investigated.)

By the time the library's files have outgrown hard disks, CD/ROM might be produced locally. Hopefully, by that time production will be less expensive, and the technology will have improved to allow disks to be updated more conveniently.

4. Recommendations for UP - It is recommended that this technology be adopted for the library as soon as possible, for the following reasons:

- The interface equipment is readily available and maintained here.

- The library's files could be conveniently stored and accessed; the files would not exceed one or two disks for several years.

- Each library at each campus can have quick and convenient access to the union catalog, serials files, and indexes on one (eventually two) disk(s).

- Telecommunications will not be required to provide the campuses outside Manila with access to the complete file. (An alternate approach would be to furnish each library with several diskettes which they would have to access separately to do exhaustive searches of the collection.)

C. Telecommunications

The telecommunications system currently available at UP and between campuses would not support a telecommunications network. However, there are indications that a telecommunications system might be donated to the university. Hopefully the system would use a medium that would allow relatively high-speed transmission of data. For the library's system, a transmission rate of 300-1200 baud (bits per second) would be adequate.

If optical disk storage replaces the need for remote online access to the library's database, there are constant requirements for the campuses and libraries to communicate regularly and conveniently. Improving the capability for telephone conversations would be extremely helpful. Also required is an electronic mail service, for all types of interlibrary communications such as

- administrative communications, e.g., memoranda

- loan requests

- cross-checking for avoidance of duplication in orders.

Considering the price of books and the requirement for the various campuses' holdings to be shared, telefacsimile capability should be added as soon as possible. This would allow pages' images to be transmitted via telephone to a copier at the receiver's location.

If NEC donates a telecommunication system, its specifications should include those required for data transmission between campuses and for interfacing with the university's mainframes.

Other campuses' mainframes should be taken into consideration as well as Diliman's; at present, the only other mainframe is at UP/LB.

If the NEC donation does not materialize, communications technology should be tracked for eventual use by the library. At present, the least expensive means of sending voice and data grade signals are microwave and satellite transmission. The required equipment for either is relatively inexpensive and, in most cases, extremely easy to maintain. Microwave technology, or

one of its variations, e.g., cellular communications, would seem to be ideal for linking the UP campuses.

These options are, technologically, readily available, inexpensive to purchase and maintain, and relatively trouble-free. However, related bureaucratic and administrative issues are never easy to surmount. As the technology is being observed for eventual library applications, it is recommended that bureaucratic measures be taken to pave the way.

Costs for online database service, optical disk applications, and telecommunications improvements are not included in the estimated costs for library automation (Section VIII).

D. Development of Philippine Databases

In business, economics, and the social sciences, the primary need in the Philippines is for Philippine data. These data are also required in other countries, and by international and multinational organizations.

It is recommended that UP investigate the possibility of establishing a Philippine data center that would collect various types of data, create databases, furnish them to university users free of charge, and sell them to other organizations.

Philippine data is currently available via Chase Econometrics and other commercially-available databases that provide worldwide coverage. Many locally-produced databanks should be available and valuable if turned into machine-readable, easily usable databases. The contents of those databases should be examined, to determine areas that are not currently covered. Those areas should be prioritized according to need and potential market, and the gaps should be filled by the university-based data center.

This would require research, planning, funding, staffing, and administrative support from the university. It would require several years and significant funding to implement. Costs for this activity have not been included in Section VIII.

VII. LEGIS SYSTEM

A. Background

The LEGIS system is being developed at the Legal Resources Center (LRC) and is related to the Law Library.

The system would capture all Philippine legislative material and would be used by legal professionals from all sectors. Eventually it would become an ASEAN regional information center.

LRC and Computer Center staff have looked into various approaches to implementing a LEGIS system. It would require a high-capacity, full-text retrieval system. While hardware and software are available for large textual applications, they are expensive. Even more challenging than obtaining hardware and software are

- o the conversion of the large volumes of text to a machine-readable database;
- o developing formats and standards for consistency among the Philippine legal/legislative community; and
- o convincing the legal community to use and support the system.

The LRC has put up a pilot database on IBM's equipment, using STAIRS as the database management and retrieval software. The system "worked", but some database refinements as well as extensive user education were required. LRC has therefore resorted to an interim solution, i.e., to develop a retrieval system via DBase III allowing them to enter brief descriptive information on Supreme Court case titles and decisions. This will assist the Law Library in serving its users.

B. Possible Sharing of Library Hardware and Software

Since the LRC has not found a viable solution for LEGIS, it is recommended that they consider the use of the hardware and software selected for the library system, especially if a mainframe system is selected. Any of the systems under consideration for the library could as well serve LEGIS. One of the systems being considered is IBM's STAIRS.

It should be noted that, while the basic software could be used for LEGIS, it would have to be tailored to LEGIS' specific needs. It is unlikely that the library's input formats and report formats could serve LEGIS' needs; nor would LEGIS be likely to require all of the formats developed for the library. The library's and the LEGIS databases would never be merged.

C. Other Recommendations

Some international organizations, such as the International Labor Organization (ILO) are operating legal information systems. LRC should investigate these systems' suitability for LEGIS. If one of the systems would serve LEGIS' needs, a request could be made for free or low-cost use of the software.

Since LRC plans to develop an ASEAN regional center, it could be especially attractive to the international organizations as an opportunity to serve a regional activity.

D. Additional Technological Support

To assist in processing and handling the extremely large volumes of textual information, the following are recommended:

1. Optical Scanning - This is not a new recommendation to the LRC. They have investigated the possible use and costs of optical scanning equipment. It is, however, recommended that this equipment be acquired at the outset of large-scale data entry. This will allow the use of personnel for the necessary editing of the scanned data rather than keying the data. The latter approach would be extremely slow; it would require many persons and terminals, working over several years, to input all required text.

2. Optical Disk Storage - As a storage medium, compact disk systems, using CD/ROM technology should be considered for LEGIS' use. This technology is described in Section VII-B.

Costs for LEGIS activities have not been addressed.

VIII. ESTIMATED COSTS

Hardware/Software (to be purchased)

Mainframe computer and peripherals	Available at Computer Center
67 IBM PC/XT compatible microcomputers with 20MB hard disk @ P24,000	P1,608,000
58 Dot-matrix printers @ P14,000	812,000
5 Letter-quality printers @ P24,000	120,000
67 Voltage regulators @ P2,500	187,500
76 Local area network nodes or modems @ P8,000	608,000
Miscellaneous computer-related supplies (diskette cabinets, etc.)	50,000
1 CDS/ISIS mini-micro version 1.0	Free from UNESCO
1 CDS/ISIS mainframe version 4.5 (or most recent version)	Free from UNESCO
Total for Hardware/Software	P3,385,500
Professional development (over 3 years)	P1,000,000

Annual Expenses

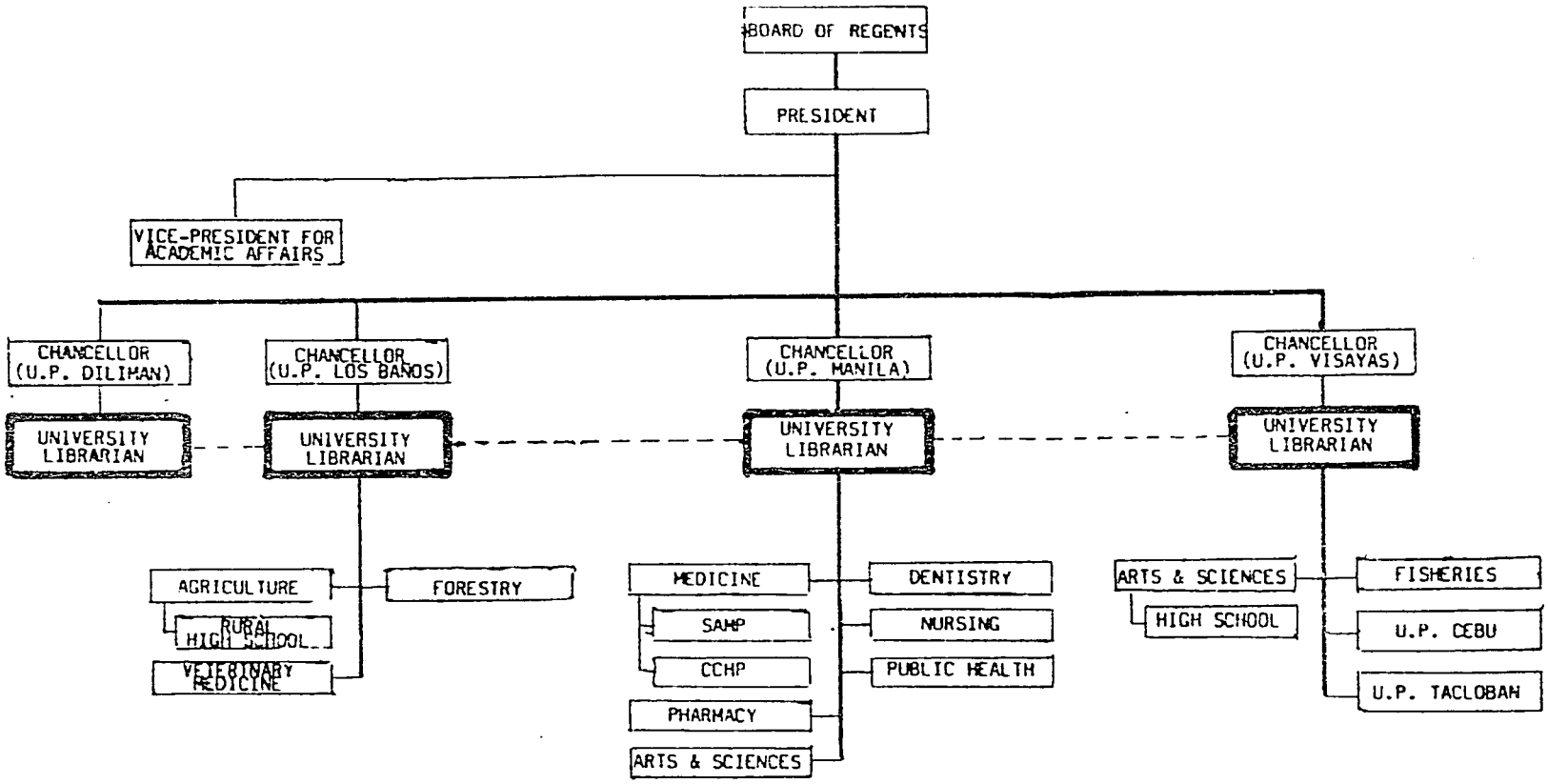
200 Printer ribbon cartridges @ P200	P 40,000
150 cartons regular computer paper (2,000 sheets, 8 1/2 x 11) @ P230	34,500
10 cartons letter-quality computer paper (2,000 sheets, 8 1/2 x 11) @ P1,000	10,000
500 boxes diskettes (10/box) @ 310	155,000
Maintenance for equipment @ 10% of cost	338,550
Postage, long distance communications	30,000
Online retrieval service & related materials	100,000
Total Annual Expenses	P 708,050

Estimated Costs for First 3 Years

Hardware/Software	P3,385,500
Professional development	1,000,000
Annual expenses x 3	2,124150
Total Estimated Costs for First 3 Years	P6,509,650

APPENDIX A

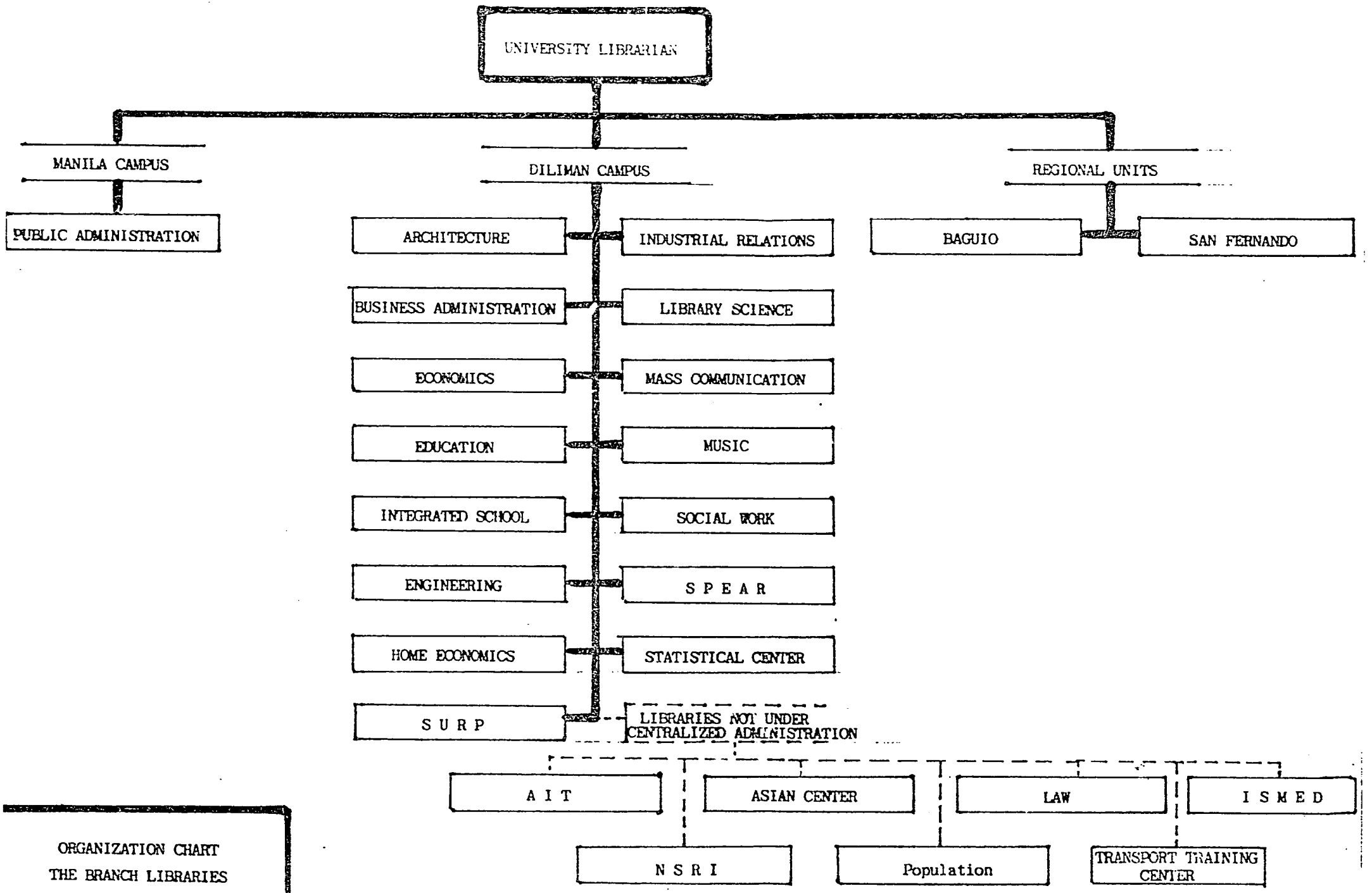
UP Library System Organization Charts



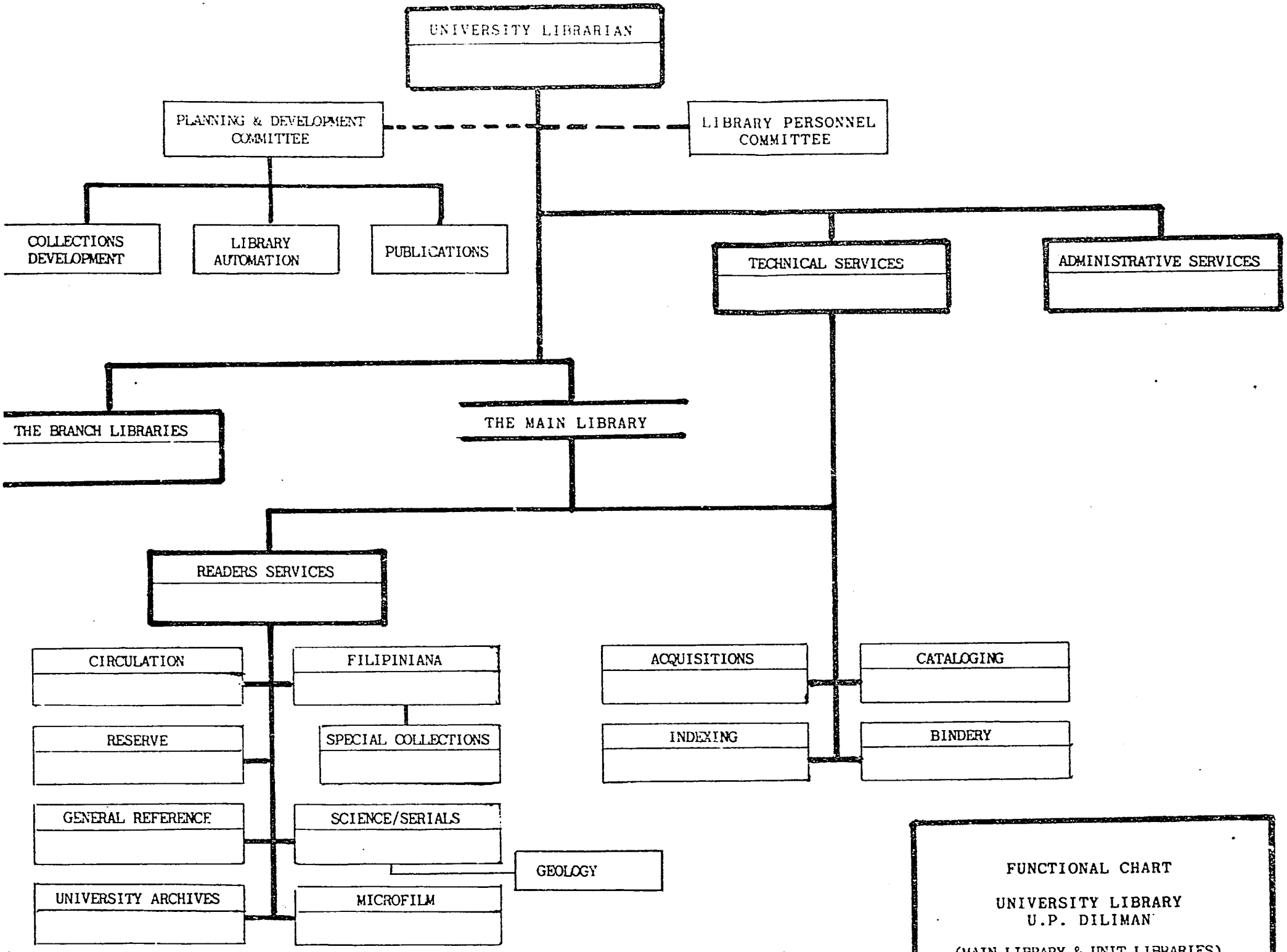
ORGANIZATION CHART

U.P. LIBRARY SYSTEM NETWORK

U.P. DILIMAN
U.P. LOS BAÑOS
U.P. VISAYAS
U.P. MANILA



ORGANIZATION CHART
THE BRANCH LIBRARIES
U.P. DILIMAN



FUNCTIONAL CHART

UNIVERSITY LIBRARY
U.P. DILIMAN

(MAIN LIBRARY & UNIT LIBRARIES)

APPENDIX B

Flow Diagrams for Selected Library Procedures

TECHNICAL SERVICES

ACQUISITIONS

PURCHASES

A. Preparation for ordering
- * 1. Budget clearance of recommendation for purchase.
- * 2. Provisions or typing of order slips.
- * 3. Bibliographic searching.

Releasing of Orders
- 1. Assigning orders to jobbers and publishers.
- * 2. Typing of letter orders.
- 3. Proofreading of letter orders against order slips.
- 4. Checking of letter orders for signature and actual release.
- * 5. Typing of requisition and proofreading.
- * 6. Stamping letter order number and date release on all copies of order.
- * 7. Filing of order slips in OOF/IPF file.
- * 8. Revision of filed order slips.
- * 9. Sorting of letter orders.
- * 10. Computing the amount of actual letter order releases.
- * 11. Recording statistics.
- * 12. Filing of letter orders in respective folder.

GIFTS & EXCHANGES

- * 1. Soliciting gifts (letter request and field work.
- 2. Establishing exchange partners.
- * 3. Receiving and recording of materials received.
- * 4. Acknowledging by letters, materials received.
- 5. Preliminary description.
- 6. Stamping of ownership mark (legal deposit).
- * 7. Searching (OOF/IPF file and Union catalog).
- * 8. Determining unit libraries to receive new titles on specific subjects and
- 9. Duplicates.
- * 10. Actual distribution to unit libraries.

PAYMENT OF PRO-FORMA INVOICES

1. Posting
   - * a. Subscriptions (Serial payment card, requisition file and subscription ledger)
   - * b. Books (Letter order)
- * 2. Checks kardex for last issue received - periodicals only
- * 3. Prepares invoices for typing (arrange by dealers and add)
- * 4. Typing of vouchers, transmittals and availability of funds for current purchases.
- 5. Proofreading, assigning of voucher no., transmittal no. and date, and facsimile of the University Librarian; and segregating invoices, and transmittals into sets.
- 6. Checks and signs or initial finished vouchers and transmittals.
- * 7. Filing of paid invoices, vouchers and transmittals.

RECEIVING

1. Unpacking, sorting and other preparatory tasks.
2. Processing short reports from publishers and jobbers.
- * 3. Checking books against invoice and posting in the letter order.
- * 4. Posting received periodicals in the kardex.
- * 5. Claiming non-receipt and requesting replacement of defective copies received.
   - a. books
   - b. periodicals

ACCESSIONING

1. Collating books.
- * 2. Pulling OOF slips from OOF/IPF file and checking against books received.
- * 3. Providing processed slips for books on:
   - a. Purchased under Standing order basis.
   - b. On examination basis.
- * 4. Stamping ownership mark and accession number, and pasting date due slips.
- * 5. Revision of accessioned books and slips.
- * 6. Typing of inventory list.
- * 7. Revision of typed inventory list.
- * 8. Filing of IPF slips in OOF/IPF file.
- 9. Transfer of processed books to Cataloging Section.

PAYMENT OF BOOKS RECEIVED

(Follow steps 5-7 of Procedures for Payment of Proforma Invoices)

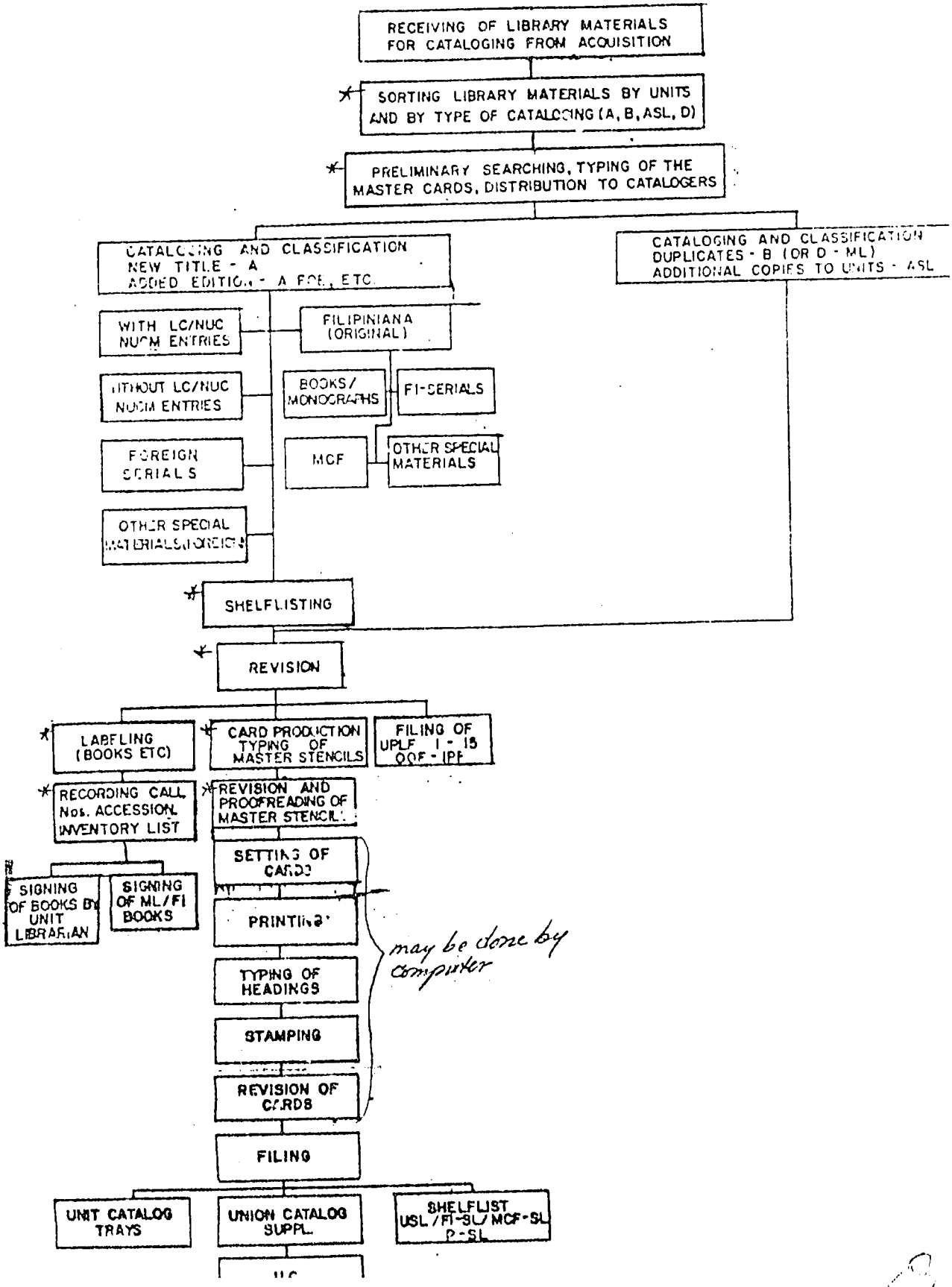
ACQUISITIONS FLOW CHART

* COMPUTER PERFORMS OR ASSISTS

UNIVERSITY OF THE PHILIPPINES LIBRARY

CATALOGING SECTION

FLOW CHART



Computer-produced or computer-assisted

START

INDEXER
1. Indexes periodicals articles
*2. Maintains the ff. files:
- Subject Authority File
- Issue Coverage File

TYPIST
*1. Types set of slips (A & F) for each article indexed following format in Home. of February 4, 1969

REVISER
*1. Checks typed entries
- verifies author headings, subject headings, added entries & cross references
*2. Sorts IPP slips - A & S
*3. Notes IPP issue for each periodical indexed & revised
*4. Updates list of periodicals indexed

FILER
*1. Sorts, alphabetizes, & interfiles slips in each file - Author
- Subject

REVISER
1. Checks filing of entries
*2. Consolidates entries when applicable

FILER
*1. Pastes alphabetized slips to prepare Author Index & Subject Index for photoduplication

PHOTODUP MACHINE OPERATOR
1. Produces 3 photocopies each of Author Index & Subject Index

FILER
*1. Collates photocopies of A & S indexes
2. Traces non-legible prints
3. Selects best copy for publication file
} may be deleted
*4. Prepares the 2 copies for binding

FILER
1. Binds

(1)

REVISER
*1. Sends bound copies of A & S indexes to Pi-Section with transmittal
*2. Prepares preliminary paper for IPP semi-annual issue for publication

TYPIST
*1. Types 1st draft of semi-annual issue

REVISER
1. Proofreads 1st draft
2. Notes corrections on duplicate

TYPIST
*1. Types corrections
*2. Prepares layout of the final draft

REVISER
1. Proofreads final draft
2. Notes corrections in slips

TYPIST
*1. Types corrections on final draft

(2)

(2)

PHOTODUP MACHINE OPERATOR
1. Produces master stencils of the IPP issue

MULTILITH MACHINE OPERATOR
1. Prints 150 copies of the index
2. Collates

BINDER
1. Binds
2. Submits copies to L.O. or whoever takes charge of the Library publications

END

APPENDIX C

Letter of Approval for Use of CCF

October 20, 1986

Mrs. Belen B. Angeles
Officer-in-Charge
University of the Philippines Library
Diliman, Quezon City

Dear Mrs. Angeles:

I have the honor to submit my impressions on Common Communication Format (CCF):

1. It looks like CCF can meet our cataloging requirements. Compared with LC MARC II, I believe they are basically the same. Perhaps, one advantage of CCF is that it was developed out of LC MARC II. In a sense, CCF is an improvement of LC MARC II.

2. CCF is very comprehensive. It covers all areas/fields in a catalog entry, taking into consideration AACR2. It looks like LC MARC II has been outdated by AACR2 (or is there a latest version of LC MARC II which takes into consideration AACR2?)

3. CCF is flexible. It includes optional fields which give any cataloging agency an option to adopt or not.

Very truly yours,

RODOLFO Y. TARLIT

6

APPENDIX D

File Size and Workload Projections

1. Cataloging File Size and Workload Projections

CAMPUS	ACQS./YEAR*	EST'D ACQS. FOR 1980's*	EST'D ACQS. FROM GRANT**	EST'D ACQS. FROM BACKLOG**	EST'D TOTAL FOR 1980's	ESTIMATED FILE SIZE***	NUMBER MEGABYTES	NO.20MB DISKS
Diliman	12,800	128,000	16,500	7,500	152,000	136,800,000	136.8	6.84
Los Baños	624	6,240	1,335	750	8,325	7,492,500	7.5	0.38
Manila	860	8,600	5,000	600	14,200	12,780,000	12.8	0.64
Visayas	800	8,000	6,000	600	14,600	1,314,000	1.3	0.07
T O T A L	15,084	150,840	28,835	9,450	189,125	158,386,500	158.5	7.92
			(=9,612/yr.)	(=3,150/yr.)				

Addnl. work from grant (to be ordered over next 3 years) = 9,612/year

Addnl. work from grant, backlog (to be cataloged over next 3 years) = 12,762/year

Cataloging: % addnl. work = 46% over 3 years

Acquisitions: % addnl. work = 39% over 3 years

*At current rate of acquisition.

**Over 3 years

***Estimated record length 1000 characters; reduced by 10% assuming 10% overlap among campuses.

2. Indexing File Size and Workload Projections

CAMPUS	ANNUAL INDEXING VOLUME*	BACKLOG	EST'D TOTAL FOR 1980'S	EST'D FILE SIZE** (NO. CHARACTERS)	NO. MEGABYTES	NO.20MB DISKS
Diliman	8,890	7,500	16,390	16,390,000	16.4	0.82
Los Baños	1,900	4,300	6,200	6,200,000	6.2	0.31
Manila	17,280	6,000	23,280	23,280,000	23.3	1.16
Visayas	1,000	9,000	10,000	10,000,000	10.0	0.50
T O T A L S	29,070	26,800	55,870	55,870,000	55.9	2.79
		(=8,933/yr.)				

Addnl. work from backlog (to be processed over next 3 years): 8,933/year

Total annual volume including backlog = 38,003/year

% additional work = 24% over 3 years

*Based on current rate of acquisition

**Estimated record length 1000 characters

3. Serials File Size and Workload Projections

CAMPUS	EST'D ACTIVE SERIALS/1980's	EST'D ACQ. FROM GRANT	EST'D TOTAL FOR 1980's	EST'D FILE SIZE** (NO. CHARACTERS)	NO. MEGABYTES	NO.20MB DISKS
Diliman	1,500	1,650	2,050	2,460,000	2.4	0.12
Los Baños	1,699	25	1,724	2,068,800	2.1	0.11
Manila	414	586	1,000	1,200,000	1.2	0.06
Visayas	200	60	260	312,000	0.3	0.02
T O T A L S	3,813	1,221	5,034	6,040,800	6.0	0.31

Addnl. work from grant acquisitions (to be processed over next years) = 1,221

% additional work = 24%, continuing

*Based on curent active serials

**Estimated record length 1,200 characters

APPENDIX E

Databases Available from DIALOG Service

DIALOG DATABASES, Rates, and Services*

By Database Number

		Online Connect Time Rate $/Hour	Online Connect Time Rate Per Minute	Offline Print Rate Per Full Record‡	Online Type or Display Rate Per Full Record‡	Special Services Available†
1	ERIC	$ 30	$ .50	$ .14	$ .10	C,S
5	BIOSIS PREVIEWS	84	1.40	.34	.24	C,S
6	NTIS	69	1.15	.25	.25	C,S
7	SOCIAL SCISEARCH® (subscribers)	69	1.15	.35	.30	C,S
7	SOCIAL SCISEARCH® (nonsubscribers)	105	1.75	.35	.30	C,S
8	COMPENDEX®	108	1.80	.47	.35	C,S
9	AIDS ARM	25	.42	.10		C
10	AGRICOLA 79–	39	65	20	.10	C,S
11	PsycINFO	55	92	.20	.35	C,S
12	INSPEC 1969–1976	96	1.60	.46	.36	C
13	INSPEC 1977–present	96	1.60	.46	.36	C,S
14	ISMEC	84	1.40	.40	.30	C
15	ABI/INFORM®	81	1.35	.60	.50	C,S
16	PTS PROMT	114	1.90	.58	.48	C,S
17	PTS ANNUAL REPORTS ABSTRACTS	114	1.90	.68	.58	C
18	PTS F&S INDEXES 1980–present	114	1.90	.33	.28	C,S
19	CHEMICAL INDUSTRY NOTES	110	1.83	.35	.23	S
20	FEDERAL INDEX	90	1.50	.20		C
21	NCJRS	35	58	.30	10	C
23	CLAIMS™/U.S. PATENT ABSTRACTS 50–70	95	1.58	50	.25	
24	CLAIMS™/U.S. PATENT ABSTRACTS 71–81	95	1.58	.50	.25	
25	CLAIMS™/U.S. PATENT ABSTRACTS 82–	95	1.58	.50	.25	
26	FOUNDATION DIRECTORY	60	1.00	.30		C
27	FOUNDATION GRANTS	60	1.00	.30		C
28	OCEANIC ABSTRACTS	87	1.45	.45	.40	C
29	METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS	95	1.58	.15		C
30	CHEMSEARCH™	158	2.63	32	.18	
32	METADEX	90	1.50	.30	.20	C,S
33	WORLD ALUMINUM ABSTRACTS	72	1.20	20	10	C
34	SCISEARCH® (subscribers) 84–	63	1.05	.25	.20	C,S
34	SCISEARCH® (nonsubscribers)	159	2.65	.25	.20	C,S
35	DISSERTATION ABSTRACTS ONLINE	72	1.20	.25	25	C,S
36	LINGUISTICS & LANGUAGE BEHAVIOR ABSTRACTS	66	1.10	.30	.25	C
37	SOCIOLOGICAL ABSTRACTS	60	1.00	.30	.20	C,S
38	AMERICA: HISTORY & LIFE	65	1.08	.15		C
39	HISTORICAL ABSTRACTS	65	1.08	.15		C
40	ENVIROLINE®	95	1.58	.30	20	C,S
41	POLLUTION ABSTRACTS	84	1.40	.40	.30	C,S
42	PHARMACEUTICAL NEWS INDEX	126	2.10	.55	.55	C,S
43	ADTRACK™	95	1.58	.25	.25	C
44	AQUATIC SCIENCES & FISHERIES ABSTRACTS	87	1.45	.45	40	
45	APTIC	35	.58	.10		C
46	A-V ONLINE	70	1.17	.20		C
47	MAGAZINE INDEX™	84	1.40	.20	.10	C,S
				7.00§	7.00§	
49	PAIS INTERNATIONAL	69	1.15	.30	.20	C,S
50	CAB ABSTRACTS	55	.92	.35	.25	C,S
51	FOOD SCIENCE & TECHNOLOGY ABSTRACTS	75	1.25	.25	.15	C,S
52	TSCA INITIAL INVENTORY	45	.75	15		C
54	EXCEPTIONAL CHILD EDUCATION RESOURCES	35	.58	.15		C
55	BIOSIS PREVIEWS 1977–1980	84	1.40	.34	.24	C
56	ARTBIBLIOGRAPHIES MODERN	60	1.00	.15		C
57	PHILOSOPHER'S INDEX	55	.92	.15		C
58	GEOARCHIVE	75	1.25	.30	.15	C
60	CRIS/USDA	40	67	.15		C

*Rates and services effective March 1, 1986.

†Special services: C (Classroom instruction program); S (SDI, current awareness); R (REPORT)

‡Format 9

§Unless indicated otherwise, full format is Format 5

DIALOG DATABASES, Rates, and Services*

By Database Number

		Online Connect Time Rate $ Hour	Online Connect Time Rate Per Minute	Offline Print Rate Per Full Record†	Online Type or Display Rate Per Full Record†	Special Services Available†
61	LISA	$ 75	$ 1.25	$ .25	$ .25	C,S
62	SPIN§	48	.80	.25	.10	C
63	TRIS	45	.75	.15		C,S
64	CHILD ABUSE & NEGLECT	35	.58	.10		C
65	SSIE CURRENT RESEARCH	78	1.30	.20		C
66	GPO MONTHLY CATALOG	35	.58	.10		C,S
67	WORLD TEXTILES	55	.92	.10		C
68	ENVIRONMENTAL BIBLIOGRAPHY	60	1.00	.15		C
69	ENERGYLINE®	95	1.58	.30	.20	C,S
71	MLA BIBLIOGRAPHY	55	.92	.15		C
72	EMBASE 1982–	84	1.40	.33	.44	C,S
73	EMBASE in process	84	1.40	.33	.44	C,S
74	INTERNATIONAL PHARMACEUTICAL ABSTRACTS	69	1.15	.38	.27	C,S
75	MANAGEMENT CONTENTS®	90	1.50	.55	.48	C,S
76	LIFE SCIENCES COLLECTION	87	1.45	.45	.35	C,S
77	CONFERENCE PAPERS INDEX	84	1.40	.40	.30	C,S
78	NATIONAL FOUNDATIONS	60	1.00	.30		
79	FOODS ADLIBRA™	63	1.05	.15	.10	C
80	PTS AEROSPACE/DEFENSE MARKETS & TECHNOLOGY	150	2.50	.78	.68	
81	PTS U.S. FORECASTS	114	1.90	.48	.38	C
82	PTS U.S. TIME SERIES	114	1.90	.40	.35	C
83	PTS INTERNATIONAL FORECASTS	114	1.90	.48	.38	C
84	PTS INTERNATIONAL TIME SERIES	114	1.90	.40	.35	C
85	GRANTS	60	1.00	.30		C
86	MENTAL HEALTH ABSTRACTS	66	1.10	.20	.10	C
87	SCISEARCH® 81–83 (subscribers)	63	1.05	.25	.20	C
87	SCISEARCH® 81–83 (nonsubscribers)	159	2.65	.20	.20	C
89	GEOREF	87	1.45	.45	.40	C,S
90	FOREIGN TRADE & ECON ABSTRACTS	78	1.30	.30	.25	C,S
91	POPULATION BIBLIOGRAPHY	55	.92	.10		C
93	U.S. POLITICAL SCIENCE DOCUMENTS	65	1.08	.15		C
94	SCISEARCH® 78–80 (subscribers)	63	1.05	.25	.20	C
94	SCISEARCH® 78–80 (nonsubscribers)	159	2.65	.25	.20	C
96	FLUIDEX	69	1.15	.28	.18	C
97	RILM ABSTRACTS	65	1.08	.15		C
98	PTS F&S INDEXES 1972–1978	114	1.90	.33	.28	C
99	WELDASEARCH	84	1.40	.25	.20	C
100	DISCLOSURE® FINANCIAL S	45	.75	11.00	7.00	C,R
101	CIS	90	1.50	.25		C
102	ASI	90	1.50	.25		C
103	DOE ENERGY 1983–present	78	1.30	.25	.25	S
104	DOE ENERGY 1974–1982	78	1.30	.25	.25	
105	FOREIGN TRADERS INDEX	54	.90	.25	.25	
106	TRADE OPPORTUNITIES	45	.75	.25		
107	TRADE OPPORTUNITIES WEEKLY	45	.75	.50		
108	AEROSPACE DATABASE	78	1.30	.25	.20	S
110	AGRICOLA 1970–1978	39	.60	.20	.10	C
111	NATIONAL NEWSPAPER INDEX™	84	1.40	.20	.10	C,S
112	AQUACULTURE	35	.58	.15	.10	C
113	STANDARDS & SPECIFICATIONS	65	1.08	.30	.20	C
114	ENCYCLOPEDIA OF ASSOCIATIONS	54	.90	.75	.75	C
117	WATER RESOURCES ABSTRACTS	84	1.40	.35	.20	C
118	NONFERROUS METALS ABSTRACTS	45	.75	.20	.10	C
119	TEXTILE TECHNOLOGY DIGEST	65	1.08	.15		C
122	HARVARD BUSINESS REVIEW	75	1.25	7.50‡		C

*Rates and services effective March 1, 1986.

†Special services: C (Classroom instruction program); S (SDI, current awareness); R (REPORT)

‡Format 9

§Unless indicated otherwise, full format is Format 5

DIALOG DATABASES, Rates, and Services*

By Database Number

		Online Connect Time Rate $/Hour	Online Connect Time Rate Per Minute	Offline Print Rate Per Full Record‡	Online Type or Display Rate Per Full Record‡	Special Services Available†
123	CLAIMS™/REASSIGNMENT & REEXAMINATION	$ 55	$ .92	$ .50	$ .25	
124	CLAIMS™/CLASS	95	1.58	.10		C
125	CLAIMS™/U.S. PATENT ABSTRACTS WEEKLY	95	1.58	50	.25	S
132	STANDARD & POOR'S NEWS July 85–	85	1.42	.15		C,S
133	STANDARD & POOR'S CORPORATE DESCRIPTIONS	85	1.42	3.50	3.50	C
134	STANDARD & POOR'S NEWS 79–June	85	85	1.42	.15	C
135	CONGRESSIONAL RECORD ABSTRACTS	96	1.60	.25	.15	C
136	FEDERAL REGISTER ABSTRACTS	75	1.25	.20		C,S
137	BOOK REVIEW INDEX	48	.80	.25	.25	C
138	CHEMICAL EXPOSURE	45	.75	.15		C
139	ECONOMIC LITERATURE INDEX	75	1.25	.15		C
140	PsycALERT	55	.92	.20		
148	TRADE & INDUSTRY INDEX™	84	1.40	.20 7.00‡	10 7.00‡	C,S
150	LEGAL RESOURCE INDEX™	90	1.50	.20	.10	C,S
151	HEALTH PLANNING & ADMINISTRATION	36	.60	.20	.05	C
152	MEDLINE 1966–1972	36	.60	.20	.05	C
153	MEDLINE 1973–1979	36	.60	.20	.05	C
154	MEDLINE 1980–	36	.60	.20	.05	C,S
161	OCCUPATIONAL SAFETY & HEALTH	57	.95	.30	.25	C
162	CAREER PLACEMENT REGISTRY	95	1.58	1.50	1.00	C
164	COFFEELINE™	65	1.08	.20	.20	C
165	EI ENGINEERING MEETINGS®	108	1.80	.47	.35	C
166	GPO PUBLICATIONS REFERENCE FILE	35	.58	.10		C
167	WORLD AFFAIRS REPORT	90	1.50	.25	.10	C
168	INSURANCE ABSTRACTS	55	.92	.15		C
170	ONLINE CHRONICLE	35	.58	.30	.15	C
171	CRIMINAL JUSTICE PERIODICALS INDEX	66	1.10	.25	.20	C
172	EMBASE 1980–1981	84	1.40	.33	.44	C
173	EMBASE 1974–1979	84	1.40	.33	.44	C
174	CHEMICAL REGULATIONS & GUIDELINES	70	1.17	.90		C
175	BLS CONSUMER PRICE INDEX	45	.75	.50	.50	C
176	BLS PRODUCER PRICE INDEX	45	.75	.50	.50	C
178	BLS EMPLOYMENT, HOURS, AND EARNINGS	45	.75	.50	.50	C
180	ACADEMIC AMERICAN ENCYCLOPEDIA	45	.75	.25		C
182	EVERYMAN'S ENCYCLOPAEDIA	42	.70	.90	.80	C
185	ZOOLOGICAL RECORD	85	1.45	.26	.20	C
186	SCISEARCH® 74–77 (subscribers)	63	1.05	.25	.20	C
186	SCISEARCH® 74–77 (nonsubscribers)	159	2.65	.25	20	C
189	INDUSTRY DATA SOURCES™	75	1.25	.30		C
190	RELIGION INDEX	48	.80	.17		C
191	ART LITERATURE INTERNATIONAL	48	.80	.15		C
192	ARTHUR D. LITTLE/ONLINE	90	1.50	.20 100.00‡	100.00‡	
194	COMMERCE BUSINESS DAILY backfile	54	.90	.25		
195	COMMERCE BUSINESS DAILY current	54	.90	.25		S
196	FIND/SVP REPORTS AND STUDIES INDEX	78	1.30	.25	.25	C
200	DIALOG® PUBLICATIONS	15	.25	.15		C
201	ONTAP™ ERIC	15	.25	n/a	n/a	C
202	INFORMATION SCIENCE ABSTRACTS	70	1.17	.35		C
203	AGRIS INTERNATIONAL	45	.75	.15		C
204	ONTAP™ CA SEARCH	15	.25	n/a	n/a	C
205	ONTAP™ BIOSIS PREVIEWS	15	.25	n/a	n/a	C
207	ONTAP™ SOCIAL SCISEARCH®	15	.25	n/a	n/a	C
208	ONTAP™ COMPENDEX®	15	.25	n/a	n/a	C

*Rates and services effective March 1, 1986

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‡Format 9

§Unless indicated otherwise, full format is Format 5

DIALOG DATABASES, Rates, and Services*

By Database Number

		Online Connect Time Rate $ Hour	Online Connect Time Rate Per Minute	Full Rec...	Offline Print Per Full Record	Online Type of Display Rate	Services Available	Special...
209	INTERNATIONAL LISTING SERVICE	$ 60	$ 1 00	$ 1 00		$ 1 00	C	
211	NEWSEARCH™	120	2 00	.20		.10	C	
213	ONTAP™ INSPEC	15	25	n/a		n/a	C	
214	PETERSON'S COLLEGE DATABASE	54	.90	.25				
215	ONTAP™ ABI/INFORM	15	25	n/a		n/a	C	
216	ONTAP™ PTS PROMT	15	25	n/a		n/a	C	
218	NURSING & ALLIED HEALTH	54	.90	.25			C	
219	CLINICAL ABSTRACTS	69	1.15	25		.10	C	
220	CLAIMS™/CITATION pre-1947	95	1.50	50.00		50 00		
221	CLAIMS™/CITATION 1947-1970	95	1 50	50.00		50 00		
222	CLAIMS™/CITATION 1971 +	95	1.50	20 00		20 00		
223	CLAIMS™/UNITERM 1950-1970	300	5 00	.50		.25		
224	CLAIMS™/UNITERM 1971-1981	300	5.00	.50		.25		
225	CLAIMS™/UNITERM 1982 +	300	5.00	.50		.25		
226	TRADEMARKSCAN®	99	1.65	.45		.35	S	
229	DRUG INFORMATION FULLTEXT	48	.80	.35		.25	C	
230	DATABASE OF DATABASES	48	.80	.20			C	
231	ONTAP™ CHEMNAME™	15	.25	n/a		n/a	C	
232	MENU™-INTERNATIONAL SOFTWARE DATABASE™	60	1.00	.15			C	
233	MICROCOMPUTER INDEX™	45	.75	.15		30	C	
234	MARQUIS WHO'S WHO	95	1.58	.50		2 50‡	C	
235	MARQUIS PRO-files	78	1.30	.45		1 00‡	C	
236	AMERICAN MEN & WOMEN OF SCIENCE®	95	1.58	.40			C	
238	TELEGEN™	95	1.58	.30		.20	C	
239	MATHSCI®	72	1.20	.46		.32	C	
240	PAPERCHEM	87	1.45	.35		25	C	
241	ELECTRIC POWER DATABASE	55	.92	.15			C	
242	CLAIMS™ COMPOUND REGISTRY	95	1.58	.15				
243	PATLAW	120	2 00	.70			C	
244	LABORLAW	120	2.00	.70			C	
245	WATERNET™	80	1.33	.20		.10	C	
247	ONTAP™ MAGAZINE INDEX™	15	.25	n/a		n/a	C	
248	MIDDLE EAST ABSTRACTS & INDEX		55	92		25	C	
249	MIDEAST FILE	75	1 25	.30			C	
250	ONTAP™ CAB ABSTRACTS	15	.25	n/a		n/a	C	
252	PACKAGING SCIENCE AND TECHNOLOGY	69	1.15	.25		.25	C	
254	ONTAP™ MEDLINE	15	.25	n/a		n/a	C	
255	BIOSIS 1969-1976	84	1.40	.34		.24	C	
256	BUSINESS SOFTWARE DATABASE™	90	1.50	.90		90	C	
257	P/E NEWS	96	1.60	.35		.25	C	
258	AP NEWS (daily)	84	1.40	.25			C	
259	AP NEWS (backfile)	84	1.40	.25			C	
260	UPI NEWS (backfile)	85	1.42	.25			C	
261	UPI NEWS (current)	85	1.42	.25			C	
262	CANADIAN BUSINESS AND CURRENT AFFAIRS	72	1 20	20			C	
264	FACTS ON FILE®	60	1.00	.25			C	
265	FEDERAL RESEARCH IN PROGRESS (abridged)	48	.80	.20		.20	C	
266	FEDERAL RESEARCH IN PROGRESS (unabridged)	48	80	.20		.20		
268	FINIS	78	1.30	.30		20	C	
270	SOVIET SCIENCE AND TECHNOLOGY	65	1.08	.50		.40	C	
271	CONSUMER DRUG INFORMATION FULLTEXT	35	.58	.30		.20	C	
272	ONTAP™ EMBASE	15	25	n/a		n/a	C	
275	COMPUTER DATABASE™	96	1.60	.55		.50	C,S	
279	ONTAP™ CLAIMS™	15	.25	n/a		n/a	C	
280	ONTAP™ WORLD PATENTS INDEX	15	.25	n/a		n/a	C	

*Rates and services effective March 1, 1986.

‡Special services: C (Classroom instruction program); S (SDI, current awareness); R (REPORT)

‡Format 9

§Unless indicated otherwise, full format is Format ...

DIALOG DATABASES, Rates, and Services*

By Database Number

		Online Connect Time Rate $/Hour	Online Connect Time Rate Per Minute	Offline Print Rate Per Full Record§	Online Type of Display Rate Per Full Record	Special Services Available
284	IRS TAXINFO	$ 18	$ .30	$ .10		C
285	BIOBUSINESS™	117	1.95	.35	.25	C,S
287	BIOGRAPHY MASTER INDEX	63	1.05	.65	.55	C
288	BIOGRAPHY MASTER INDEX	63	1.05	.65	.55	C
290	ONTAP™ DIALINDEX™	15	.25	n/a	n/a	C
291	FAMILY RESOURCES	57	.95	.25	.25	C
294	ONTAP™ SCISEARCH*	15	.25	n/a	n/a	C
296	ONTAP™ TRADEMARKSCAN*	15	.25	n/a	n/a	C
299	MAGILL'S SURVEY OF CINEMA	54	90	.20		C
300	CHEMZERO™	158	2.63	.32	.18	C
301	CHEMNAME™	158	2.63	.32	.18	C
303	HEILBRON	95	1.58	.85	.65	C
308	CA SEARCH 1967-1971	90	1.50	.35	.23	
309	CA SEARCH 1972-1976	90	1.59	.35	.23	
310	CA SEARCH 1980-1981	90	1.59	.35	.23	
311	CA SEARCH 1982-	90	1.59	.35	.23	S
319	CHEMICAL BUSINESS NEWSBASE	110	1.83	.60	.54	C
320	CA SEARCH 1977-1979	90	1.59	.35	.23	
328	CHEMSIS™ 1967-1971	158	2.63	.32	.18	
329	CHEMSIS™ 1972-1976	158	2.63	.32	.18	
330	CHEMSIS™ 1977-1981	158	2.63	.32	.18	
331	CHEMSIS™ 1982-	158	2.63	.32	.18	
350	WORLD PATENTS INDEX (subscribers)	115	1.92	.25		S
350	WORLD PATENTS INDEX (nonsubscribers)	175	2.95	.50	.10	S
351	WORLD PATENTS INDEX LATEST (subscribers)	115	1.92	.25		S
351	WORLD PATENTS INDEX LATEST (nonsubscribers)	175	2.95	.50	.10	S
399	CA SEARCH 1967+	90	1.50	.35	.23	
410	CHRONOLOG* NEWSLETTER	15	.25	.15		C
411	DIALINDEX™	15	.25	n/a	n/a	
421	REMARC pre-1900	85	1.42	.35	.25	C
422	REMARC 1900-1939	85	1.42	.35	.25	C
423	REMARC 1940-1959	85	1.42	.35	.25	C
424	REMARC 1960-1969	85	1.42	.35	.25	C
425	REMARC 1970+	85	1.42	.35	.25	C
426	LC MARC 1980-	45	.75	.15	.10	C,S
427	LC MARC pre-1980	45	.75	.15	.10	C
470	BOOKS IN PRINT	65	1.08	.20		C
471	WILEY CATALOG/ONLINE	60	1.00	.20		C
480	ULRICH'S PERIODICALS DIRECTORY	65	1.08	.20		C
500	ELECTRONIC YELLOW PAGES INDEX	35	.58	.05		C
501	ELECTRONIC YELLOW PAGES – FINANCIAL DIRECTORY	60	1.00	.20	.20	C,R
502	ELECTRONIC YELLOW PAGES – PROFESSIONALS DIRECTORY	60	1.00	.20	.20	C,R
503	ELECTRONIC YELLOW PAGES – WHOLESALERS DIRECTORY	60	1.00	.20	.20	C,R
504	ELECTRONIC YELLOW PAGES – RETAILERS DIRECTORY	60	1.00	.20	.20	C,R
505	ELECTRONIC YELLOW PAGES – RETAILERS DIRECTORY	60	1.00	.20	.20	C,R
506	ELECTRONIC YELLOW PAGES – RETAILERS DIRECTORY	60	1.00	.20	.20	C,R
507	ELECTRONIC YELLOW PAGES – CONSTRUCTION DIRECTORY	60	1.00	.20	.20	C,R
508	ELECTRONIC YELLOW PAGES – SERVICES DIRECTORY	60	1.00	.20	.20	C,R
509	ELECTRONIC YELLOW PAGES – SERVICES DIRECTORY	60	1.00	.20	.20	C,R
510	ELECTRONIC YELLOW PAGES – MANUFACTURERS DIRECTORY	60	1.00	.20	.20	C,R
511	ELECTRONIC DIRECTORY OF EDUCATION	60	1.00	.75	.75	C
516	D&B-DUN'S MARKET IDENTIFIERS*	100	1.67	2.00	2.00	C,R
517	D&B-MILLION DOLLAR DIRECTORY*	100	1.67	2.00	2.00	C,R
518	D&B-INTERNATIONAL DUN'S MARKET IDENTIFIERS*	100	1.67	2.00	2.00	C,R
519	D&B-DUN'S FINANCIAL RECORDS™	135	2.25	74.00	74.00	R

*Rates and services effective March 1, 1985

*Special services: C (Classroom instruction program); S (SDI, current awareness); R (REPORT)

§Unless indicated otherwise, full format is Format 5

DIALOG DATABASES, Rates, and Services*

By Database Number

	Online Connect Time Rate $ Hour	Online Connect Time Rate Per Minute	Offline Print Rate Per Full Record†	Online Type or Display Rate Per Full Record†	Special Services Available
526 STANDARD & POOR'S REGISTER--BIOGRAPHICAL	$ 84	$ 1.40	$ 1.50	$ 1.50	C
527 STANDARD & POOR'S REGISTER-CORPORATE	84	1.40	1.50	1.50	C
531 TRINET ESTABLISHMENT DATABASE	90	1.50	.50	.50	C
532 TRINET COMPANY DATABASE	90	1.50	1.60	1.60	C
535 THOMAS REGISTER ONLINE™	100	1.67	1.50	1.50	C
538 ADVERTISED COMPUTER TECHNOLOGIES™ II (ACT II)	96	1.60	.60	.40	C
539 ADVERTISED COMPUTER TECHNOLOGIES™ I (ACT I)	96	1.60	1.00	.75	C
540 DISCLOSURE/SPECTRUM OWNERSHIP	60	1.00	25.00	25.00	C
541 DISCLOSURE/MANAGEMENT	45	.75	11.00	7.00	C R
545 INVESTEXT®	96	1.60	4.50	4.50	C
546 MEDIA GENERAL DATABANK	60	1.00	2.00	1.50	C,R
555 MOODY'S® CORPORATE PROFILES	60	1.00	4.00	4.00	C,R
556 MOODY'S® CORPORATE NEWS-U.S.	75	1.25	25	25	C
557 MOODY'S® CORPORATE NEWS-INTERNATIONAL	96	1.50	1.00	1.00	C
561 ICC BRITISH COMPANY DIRECTORY	96	1.50	.25	25	C
562 ICC BRITISH COMPANY FINANCIAL DATASHEETS	96	1.50	10.00	10.00	C
565 *CHASE ECONOMETRICS		– to be announced –			
570 PTS MARKETING & ADVERTISING REFERENCE SERVICE (MARS)	150	2.50	.68	58	C
575 DONNELLEY DEMOGRAPHICS	60	1.00	12.00	10.00	C
580 CENDATA™	36	.60	.20		C
581 *AGRIBUSINESS U.S.A.™		– to be announced –			
610 *BUSINESSWIRE		– to be announced –			
621 PTS NEW PRODUCT ANNOUNCEMENTS	126	2.10	1.80	60	C
624 *MCGRAW-HILL BUSINESS BACKGROUNDER		– to be announced –			
625 *AMERICAN BANKER		– to be announced –			
626 *THE BOND BUYER		– to be announced –			
647 MAGAZINE ASAP™	84	1.40	7.00‡	7.00‡	C
648 TRADE & INDUSTRY ASAP™	84	1.40	7.00‡	7.00‡	C
840 PAPERCHEM (members)	63	1.05	.25	.15	
897 P/E NEWS (subscribers)	96	1.60	.25	.15	
980 PTS AEROSPACE/DEFENSE MARKETS & TECHNOLOGY (subscribers)	111	1.85	.68	.58	
CENDATA™	36	.60	n/a	n/a	C
DIALOG® QUOTES AND TRADING	36	.60	n/a	n/a	
OAG ELECTRONIC EDITION	60	1.00	n/a	n/a	

*Rates and services effective March 1, 1986

†Special services: C (Classroom instruction program); S (SDI, current awareness); R (REPORT)

*Forthcoming file

‡Format 9

§Unless indicated otherwise, full format is Format 5